THE IRON TRADE REVIEW

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Premiums Offerd for Prompt Delivery of Plates

Prices on Finished Materials Easily Maintained and Further Advances Expected—Strong Demand for Coke

The offering of premiums for prompt delivery of plates is one of the indications of prosperity that have developed within a few days. Prices are being well maintained on finished products and further advances are expected. Higher quotations are being made on nuts and bolts, chain has advanced $2 per ton, and advances on tin plate, structural material, plates and bars at an early date would not surprise the trade. All the indications point to an extremely busy summer. Consumers are beginning to realize that probably they will need more material than they have contracted for and some are endeavoring to make additional contracts.

Coke

In response to the strong demand for furnace coke, producers in the Connellsville region have exerted their utmost efforts to increase the output, but the result has been an insignificant gain of only 50 tons, and there does not seem to be any prospect of a materially larger production this summer. Labor shortage continues to be an important factor. Among the furnaces which have recently covered for last half requirements is the second stack of the Toledo Furnace Co., to be blown in this week. It uses West Virginia coke. Two last half contracts, one for 10,000 tons a month, and the other for 6,000 tons a month, were closed at Pittsburgh at $2.35 and $2.40, respectively, but the largest producers are now holding to $2.50 as the minimum quotation for high grade Connellsville coke for the last half of the year.

Pig Iron

The pig iron market is rather quiet throughout the country, but conditions are sound and the tendency is toward higher prices. Reports to the Eastern Pig Iron Association indicate a decrease in stocks, and Virginia stocks are now lower than at any time this year. Alabama stocks decreased slightly more than 20,000 tons last month. Some additional sales of basic have been made in eastern Pennsylvania, to a very desirable customer at $15, delivered, for early delivery. The usual quotation is $15.25. An inquiry for 6,000 tons of basic for last half delivery has appeared in the Pittsburgh district, and an inquiry for from 10,000 to 12,000 tons for a central Pennsylvania consumer is still pending. The Oxford, N. J., furnace blows in this week and will make basic. There is an extreme shortage of ferro-manganese and prices are advancing.

Railroad Buying

Railroads are becoming insistent in their demands for deliveries. Rail buying is being actively maintained. The Seaboard Air Line has divided 18,000 tons about equally between the Bethlehem Steel Co. and the Tennessee Coal, Iron & Railroad Co. The Atlantic Coast Line has divided 10,000 tons between the Tennessee company and the Maryland Steel Co. A Brazilian railroad has awarded 20,000 tons to the Carnegie Steel Co., and a Cuban railroad 2,000 tons to the Lackawanna Steel Co. The New Haven system has formally closed for rail requirements amounting to 27,000 tons, of which 11,000 tons have been awarded to the Pennsylvania Steel Co., and the remainder divided between the Bethlehem and Lackawanna companies. The Middleton Car Co. has taken 1,000 cars for a railroad in Argentine. The Seaboard Air Line, currently reported as having placed 1,000 box cars with the Pressed Steel Car Co., is still negotiating. The Chesapeake & Ohio is having plans prepared for a pier at Norfolk, Va., which will require from 8,000 to 10,000 tons of structural material. The Louisville & Nashville has ordered 1,200 steel underframes. Nineteen eastern and western railroads, with Chicago connections, have arranged for more rigid inspection of rails at the mills.

Crude Steel

A large steel maker has purchased 10,000 tons of billets, making its total purchase recently in the open market about 20,000 tons of crude steel. The scarcity of semi-finished steel, especially sheet bars, is becoming more pronounced in the Pittsburgh district. There is good inquiry for billets pending at Cleveland.

Ship Building

Eastern ship yards have asked steel makers for prices on about 12,000 tons of plates and shapes for new boats. The steel required for the three additional American-Hawaiian boats will be about 8,000 tons, and will probably be rolled at a central Pennsylvania mill.

PITTSBURGH

Coke Producers Fail to Increase Output

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg., May 14.

There is no sign of halting in the present great buying movement in the iron and steel market. Manufacturers of finished and semi-finished steel are demanding longer periods for delivery and are steadily getting behind on deliveries. The pig iron market has been more quiet for a week, but its well sold up condition makes it subject to a sudden upward movement the moment any considerable new tonnage should appear. Ferro-alloys are stronger and manganese has again jumped to a higher point with scarcity of material causing concern even to those supposed to be protected by contracts. Coke contracts for the last half of the year are slowly appearing, indicating further upward tendency to prices when the volume of buying sets in. Scarcity of labor is affecting every branch of the industry, the shortage being mainly in the common laborer, though this difficulty has begun to affect the skilled class to some extent.

Pig Iron.—The market for the past week has been somewhat quiet for pig iron, not sufficient business appearing to alter the market position materially. Inquiries are largely for small lots of Bessemer and basic, Bessemer selling at $14.25 and $14.50, valley, in small tonnage for third quarter. A good deal of basic iron is selling at $13.25 in small lots. An inquiry for 6,000 tons for last half for Pittsburgh delivery was in the market this week. While $13 is still quoted on some inquiries, it is believed that the appearance of a considerable tonnage would cause a quick movement of basic to a stronger position. Evidence of quiet buying is strong in several markets at present. There has been some fairly active business in malleable at $13.25, valley, and foundry iron for last half is much firmer at $13.50, with prompt shipment orders quoted at $13.25, although such sales were confined to small lots. Gray forge is firm at $13.10 to $13.25. Considerable inquiry is in the market, and most of the leading producers are sold up for the second quarter. We quote the market as follows:

(Prompt Shipment.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	15.15
Basic, valley	13.00
Basic, Pittsburgh	13.90
No. 2 foundry, Pittsburgh	14.15
Gray forge, Pittsburgh	13.90
Malleable, Pittsburgh	14.15

(Third Quarter.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	15.15
Basic, Pittsburgh	13.90
No. 2 foundry, Pittsburgh	14.40
Gray forge, Pittsburgh	14.00
Malleable, Pittsburgh	14.15

Ferro-Alloys.—There is an extreme shortage in ferro-manganese in the Pittsburgh market. Dealers are having much difficulty in meeting shipments on contracts, and many of them are not quoting on prompt shipments at all. The advance in makers' prices for forward delivery caused no surprise. Prompt shipment manganese is selling at $56 to $60 with no guarantee of delivery. One sale was reported the past week at $80 for less than a carload lot. Fifty per cent ferro-silicon is quiet, but very firm, at $70. There is a better demand for domestic grades, and inquiries indicate a more active market approaching, but prices are unchanged.

We quote ferro-manganese at $48.50, Baltimore, and $50.00 for prompt delivery. The freight rate from Baltimore to Pittsburgh is $1.95 per ton.

Fifty per cent ferro-silicon is quoted nominally at $70, Pittsburgh, for prompt and forward delivery; 12 per cent, $22; 11 per cent, $21; 10 per cent, $20, f. o. b. Globe, Jisco and Ashland furnaces. The freight rate to Pittsburgh is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

Plates. — Plate mills are running steadily behind on deliveries, each week increasing the time required by makers on all contracts. The leading interest is asking three months, and it is not sure it can hold this for long. Shapes are in the same position, and prices are extremely firm with rumors of a probable advance in the immediate future. Car material orders are pressing heavily for shipments, and considerable new buying is in prospect. Warehouse prices on both plates and shapes by the leading interest were advanced this week from 1.60c to 1.65c, Pittsburgh. Inquiries for ship plates have not developed any new tonnage for the mills as yet. Among the recent car orders reaching Pittsburgh shops, on which plate specifications have been placed, is one for 300 steel hoppers for the Buffalo, Creek & Gauley railroad, and another for 500 under-frames by the Louisville & Nashville railroad, both of which were placed with the Pressed Steel Car Co. There is also inquiry out for between 3,000 and 4,000 cars for the Illinois Central. It is understood that the Pennsylvania and Baltimore & Ohio railroads are preparing specifications for a large number of cars, particularly the Pennsylvania system, both for lines East and West. Independent manufacturers are also reporting heavy specifications, and difficulty in making contract shipments, particularly in Central Pennsylvania district. The plate market is stronger today than that at any time during the present rapid expansion of the steel trade. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.25c. Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c Gages under ½ inch to and including $\frac{7}{16}$-inch plate on thin edge, 0.10c; under $\frac{7}{16}$ and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets. — Heavier specifications for sheets are causing difficulty on the part of mills to keep abreast of their shipping requirements, and prices are growing much firmer on both black and galvanized material. Many of the large makers are falling behind on deliveries, and especially is this the case with galvanized sheets, where from eight to ten weeks are required on deliveries by some of the important independent mills. Very little business is taken for less than four weeks' delivery. An encouraging sign of the sheet trade is the non-accumulation of stocks. The market is apparently unsatisfied in spite of the immense production, and is absorbing as rapidly as the stocks are forwarded. Lack of surplus is causing prices to become more firmly established, and there is no longer talk of any shading of the minimum of 1.95c for black sheets, and 3c for galvanized, No. 28 gage. We quote the market as follows:

Flat Sheets

Black Sheets.—Nos. 10-12, $1.60 per 100 pounds; Nos. 13-14, $1.65; Nos. 15-16, $1.70;

Nos. 17-21, $1.75; Nos. 22-24, $1.70 to $1.80; Nos. 25-26, $1.75 to $1.85; No. 27, $1.90; No. 28, $1.95; No. 29, $2.00; No. 30, $2.10.

Blue Annealed.—Nos. 3-8, $1.35 per 100 pounds; Nos. 9-10, $1.40; Nos. 11-12, $1.45; Nos. 13-14, $1.50; Nos. 15-16, $1.60.

Galvanized.—Nos. 10-11, $2.00 per 100 pounds; Nos. 12-14, $2.10; Nos. 15-16, $2.25; Nos. 17-21, $2.40; Nos. 22-24, $2.50; Nos. 25-26, $2.70; No. 27, $2.85; No. 28, $3.00; No. 29, $3.10; No. 30, $3.30.

Roofing Sheets

Galvanized

Net extras on all gages per 100 pounds. Corrugated 2-inch, 2½-inch, 3-inch and 5-inch corrugation, 5c; 2 V crimped without sticks, 5c; corrugated 1¼-inch corrugation, 10c, 3 V crimped without sticks, 10c; pressed standing seam with cleats, 15c; plain roll roofing with cleats, 15c.

Painted Roofing

12 to 18 gage, inc., 5c; 19 to 24 gage, inc., 10c; 25 to 28 gage inc., 15c.

Tin Plate.—Most of the larger manufacturers of tin plate are advising customers to cover their requirements on present prices at the earliest possible date. While no direct statement is forthcoming that prices will advance, the inference is strong and the market seems to have taken it seriously. Specifications have increased to an extent that is crowding every tin mill to its capacity. The minimum of $3.40 per base box for coke tin is general, and new business is taken on this basis. The demand for terne plate has also increased, and much tonnage is being quietly booked, while specifications are running much heavier. We quote the market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.40, f. o. b. mill, Pittsburgh district.

Rails and Track Material.—Specifications against contracts for standard section rails during the past week have been extremely heavy. The leading interest is slowly getting behind on deliveries for open-hearth rails, and is operating to its capacity. The market for light rails has shown much improvement, owing to the general settlement of coal field strikes. Buying has increased, and prices are being held with the advance made a few weeks ago without difficulty. New business in standard rails, while large in some sections of the country, has not reached the Pittsburgh producing point as yet, but there are inquiries, and the known requirements drawing on this district, are such as to insure a very large tonnage being placed for the last half delivery. The market for track material has improved, and the demand for all forms of track supplies is stronger. Specifications are much heavier with more favorable weather conditions for track construction work. Considerable buying of railroad spikes is reported, and prices are very firm. The market is quoted as follows with the base price 1.34c per pound at the mill:

Fifty-pound and heavier, 1.25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.15c, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburgh; track bolts, 2.20c to 2.25c, Pittsburgh.

Railroad Spikes

4½, 5 and 5½ and 9-16	$1.40
3, 3½, 4, 4½ and 5 x ½	.10
3½ 4 and 4½ x 7/16	.20
3, 3½, 4 and 4½ x 3/8	.30
2½ x 3/8	.40
2½, 3 and 3½ x 7/16	.60
2 x 5-16	.80

Steel.—The scarcity in semi-finished steel, particularly in sheet bars, is becoming more pronounced from week to week. The supplemental buying by large consumers is unusually heavy, and inquiries for third quarter and last half tonnages indicate some very active buying by large consumers. Billets are also in good demand, and makers are so well booked up to July 1 that they are not seeking orders with any energy. Some of the buyers during the past week, for last half sheet bars and small rolling billets, were sounding the market carefully, and were somewhat skeptical of the reported strength in this product, but quickly altered their opinions. Tenders of $21.50 for sheet bars for last half were promptly declined by producers. Forging billets are very firm at $28, although the actual volume of business is not large. For prompt shipment in small lots billets and sheet bars have been sold at $21.50, Pittsburgh and Youngstown. The leading interest reports the heaviest specifications for the past week in semi-finished steel in the history of the company. We quote the market as follows:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $21.00 to $21.50, with the usual extra for size and analysis, and open-hearth rolling billets, $21.00 to $21.50. Bessemer sheet and tin bars are quoted at $21.50 to $22.50, and open-hearth sheet bars are quoted at $21.50 to $22.50, f. o. b. Pittsburgh, for second quarter, with full freight to destination added. Forging billets are quoted at $28, Pittsburgh.

Hoops and Bands.—Specifications are heavy on hoops and bands, and shipments are satisfactory, but new business is not important as to volume. Prices are firm and unchanged. We quote the market as follows:

Hoops in carload lots, 1.25c to 1.30c, Pittsburgh; in less than carload lots, 1.40c; bands 1.20c, base, with net extras, as per standard steel.

Merchant Bars.—The demand for iron bars has become somewhat stronger, and prices are firmer, the minimum being 1.30c to 1.35c on attractive tonnages. Steel bars are selling freely at the new price of 1.20c, Pittsburgh, and current new business is considerably larger than a week ago. The strength of this material in the Pittsburgh market is greater than had been anticipated. The leading interest has advanced the price on warehouse stocks of bars $1 a ton from 1.55c to 1.65c during the past week, the advance conforming to the general market advance on mill shipments. Steel shafting is stronger and better prices are obtainable while inquiries are much larger. We quote the market as follows:

Common iron bars, 1.30c to 1.35c, Pittsburgh; Bessemer and open-hearth steel bars, 1.20c; plow and cultivator, 1.25c; channels, angles, zees, tees, under 3 inch, 1.25c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds of a size, 0.35 advance. Cold rolled and ground shafting, 65 per cent off in carloads and 60 and 10 per cent in less than carloads, delivered in base territory.

Muck Bar.—There is a rapid dwindling of surplus stocks of muck bar owing to the heavier consumption, and a general shortage of iron skelp, and while the tonnage actually booked is very small, the market has grown firmer and an advance of a dollar a ton has become general, the new price being quoted at $29 to $30. The makers are confident of a much larger tonnage in the immediate future. We quote $29 to $30, Pittsburgh.

Structural.—Fabricators of structural material are still reporting a somewhat quiet situation in the Pittsburgh territory, but bookings are large in the eastern and western sections and have affected the local shops favorably. There is very little idle capacity among the leading fabricating companies. The general trend of prices, however, has been unsatisfactory, and there is little indication of improvement in the immediate future, or until a number of the independent shops have become better filled with tonnage. Inquiries are mostly for small tonnages. One general contract for a new theater at Penn avenue and Seventh street, Pittsburgh, was awarded the past week, for which the steel is still unallotted. Some small additions to industrial buildings and some highway bridges are also under consideration in the Pittsburgh territory, and are still in indefinite form. Raw material prices are very firm. We quote the market as follows:

Beams and channels, 15 inches and under, zees, 1.25c; tees, 1.25c; angles, from 3 to 6 inches, 1.25c; over 6 inches, 1.35c; universal and sheared, 1.30c; over 15 inches, 1.35c; plates, 6¼ inches wide and wider, 1.35c.

Merchant Pipe.—Some weakness in the prices of oil country goods that seemed to pervade the market for the past ten days was dissipated the past week quite suddenly, and mills

are now holding to their list very firmly and are rejecting tenders below the official card rates. Steel line pipe inquiries as well as orders are very satisfactory, but no exceptional tonnages have been placed, nor does there appear to be any extensive mileage in the immediate prospect included in one order. There is one project calling for about 45 miles of 16-inch line pipe expected in the market in the near future, the survey for the extensive new line now being under way in central Pennsylvania. Merchant pipe has increased in demand, and prices are very firm. Practically all mills are running to capacity on this material. Iron pipe makers are crowded with new business, and specification are the heaviest in a long time. We quote the official discount to jobbers, subject to the usual preferential discount to the larger buyer as follows:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
	Butt weld.			
	Black.	Galv.	Black.	Galv.
⅛, ¼ inch.....	74	54	68	48
⅜ inch	75	65	69	53
½ inch	78	68	72	59
¾ to 1¼ inch.....	81	73	75	64
2 to 3 inches.....	82	75	76	65
	Lap weld.			
2 inches	79	72	72	63
2½ to 4 inches.....	81	74	74	66
4½ to 6 inches.....	80	72	73	65
7 to 12 inches.....	77	68	71	61
13 to 15 inches.....	55	..	47	..
Extra Strong, Plain Ends.				
	Butt weld.			
⅛, ¼, ⅜ inch.....	70	60	65	55
½ inch	75	69	70	63
¾ to 1½ inch.....	79	73	74	65
2 to 3 inches.....	80	74	75	66
Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	76	70	71	63
2½ to 4 inches.....	81	74	74	66
4½ to 6 inches.....	77	71	72	65
7 to 8 inches.....	70	60	65	55
9 to 12 inches.....	65	55	60	50
Double Extra Strong, Plain Ends.				
	Butt weld.			
½ inch	65	59	60	52
¾ to 1½ inch.....	68	62	63	55
2 to 3 inches.....	70	64	65	57
Double Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	66	60	61	52
2½ to 4 inches.....	68	62	63	57
4½ to 6 inches.....	67	61	62	56
7 to 8 inches.....	60	50	55	45

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

The above discounts are for full weight pipe, subject to a variation of 5 per cent, merchant pipe, when specified, being furnished up to 6 inches at one point higher discount (lower price).

Boiler Tubes.—The market for boiler tubes is quiet, but specifications are large on contracts, and makers are operating more nearly to capacity. The leading interest advanced the price on seamless locomotive boiler tubes $3 a ton, but did not infer any other changes in the existing card rates. Specifications are running heavy in locomotive boiler tubes particularly. The official discount on steel and charcoal iron boiler tubes follows:

Steel

1¾ to 2¼ inch.....	65
2½ inch	67½
2¾ to 3¼ inch.....	72
3½ to 4½ inch.....	75
5 and 6 inch.....	67½
7 to 13 inch	65

Charcoal Iron

1½ inch	48
1¾ to 2¼ inch.....	50
2½ inch	55
2¾ to 5 inch.....	60

To destination east of Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Products. — Specifications on wire nails have become much greater, and mills are now operating practically to capacity, and considerable new business is reported at the new price of $1.60, while the majority of producers are running on the $1.55 contracts almost exclusively. Reports indicate very little surplus stock, and warehouses are not yet fully equipped for summer trade in nails and plain wire material. Cut nails are stronger and the minimum has advanced to $1.60. We quote the market as follows:

Wire nails, jobbers, carload lots, $1.60; retailers' carload lots, $1.60 to $1.65; cut nails (western makers), jobbers' carload lots, $1.55 to $1.60, painted barb wire, jobbers' carload lots, $1.60; retailers' carload lots, $1.65 with 30c for galvanizing; plain wire to jobbers in carloads, $1.40; and to dealers, in carloads, $1.45; polished staples, $1.60; galvanized staples, $1.90.

Wire Rods.—Specifications for wire rods are particularly active, and the demand is somewhat larger, and in placing supplemental contracts, consumers find the higher price firmly held, which is 50 cents above that of the past spring season. We quote $26 to $26.50 for Bessemer and open-hearth wire rods for second quarter delivery.

Coke.—Coke operations are being put to the severest test to meet the demand of consumers, and the Connellsville region is handicapped by a continued shortage of labor that has held in check every effort to bring the production up to the highest point. The demand for spot furnace coke is quieter at this time of the month, but there has been some tonnages quoted at $2.40 to $2.50 ovens. The demand for foundry coke is slightly improved, and most of the important producers are holding firmly to $2.75, ovens. Negotiations on last half contracts for furnace coke are still being conducted, and some lively opposition is being met with to the steady advance in quotations by coke producers. Two last-half contracts, one for 10,000 tons a month, and another for 6,000 tons a month, were closed at $2.35 and $2.40 respectively. This, however, seems to have exhausted the tonnage available at that price, and the larger producers are holding rigidly to $2.50 as their minimum quotation on Connellsville coke for the last half of the year. Scarcity of labor in the coke region has shown little sign of abatement, the majority of the operators finding it difficult to maintain their organizations and man all their ovens. The Connellsville Courier reports for the week ending May 4, 32,063 ovens active with a production of 401,544 tons, as compared with 32,591 ovens active and a production of 401,494 tons for the preceding week. This is a gain of but 50 tons, in spite of all efforts to bring the production up to a higher level. We quote standard Connellsville furnace coke for prompt shipment at $2.40 to $2.50, ovens, and contract coke at $2.40 to $2.50 ovens. For standard Connellsville foundry coke, we quote $2.60 to $2.75, for prompt shipment, and on contract $2.75 to $3.

Old Material.—Buying of scrap during the past week has been somewhat less active, consumers having apparently covered for immediate requirements, but the situation remains very strong. Heavy melting steel is scarce, and stocks in the hands of consumers are not reassuring. One sale of 5,000 tons sold at the close of last week for $13.40 to $13.50 and a few lots of 500 tons at $13.50 indicated the strength of the market as to prices. Dealers are complaining of a great scarcity of material, and are paying higher prices in gathering it. The same situation appears to hold good with other grades of scrap, and there are plenty of buyers for all that appears in the market. The Baltimore & Ohio Railroad disposed of a round lot during the past week, and the best prices are said to have been obtained, both for sales direct to consumers and to dealers. We quote gross tons delivered in the Pittsburgh district including Monessen, Brackenridge, Steubenville and Follansbee as

Heavy melting scrap.....	$13.25 to 13.50
Rerolling rails	13.50 to 14.00
Malleable	12.00 to 12.50
Bundled, sheet scrap.....	11.00 to 11.50
Iron axles	22.00 to 22.50
Old iron rails.....	15.00 to 15.50
Stove plate	9.00 to 9.50
No. 1 wrought scrap.....	12.50 to 13.00
Old car wheels.....	12.50 to 13.00
Low phosphorus	15.00 to 15.25
Machine shop turnings.....	10.00 to 10.50
Cast borings	10.00 to 10.25
No. 1 cast scrap.....	12.75 to 13.00

The Ideal Motor Car Co., of Detroit, is to be capitalized at $300,000 and locate at Akron, O., where a factory will eventually be built according to present plans. Commercial cars will be manufactured.

CHICAGO

Heavy Specifications With Some New Business

Office of THE IRON TRADE REVIEW, 1328 Monadnock Blk., May 14.

It is evident at present that the usual midsummer dullness will not materialize. In fact operating superintendents are wondering how they will get sufficient time for even a few days' shut-down for necessary repairs, which are usually made in July. The continuation of heavy specifications coupled with some increase in new business characterizes the situation in the west at present. Prices are very firm and trending upward. There is considerable talk of an advance of $1 a ton on plates and shapes and it is not improbable that this will take place within the next few weeks. The Cambria Steel Co. has been awarded 2,000 tons of open-hearth rails by the St. Paul road and 1,000 tons by thte Monon. Car orders and fabricating contracts were somewhat lighter last week.

Pig Iron.—The market for northern iron remains active, but the sales of southern furnaces in this territory have been very light recently. There has been considerable interest displayed over thte inquiry of the American Steel Foundries for basic to be delivered during the last half at the Granite City plant. The amount to be purchased depends largely upon the conditions developed during negotiations, but it seems likely that less than 10,000 or more than 20,000 tons will be ordered. It is understood that the buyer has been offered $15.75, delivered. The Grand Crossing Tack Co., Chicago, purchased 1,000 tons of basic recently for early shipment. A malleable consumer in Wisconsin has purchased 1,600 tons of malleable Bessemer from a Milwaukee furnace, the price being $14.65, f. o. b. furnace, but it is very doubtful whether this price could be duplicated. The lowest quotation both on No. 2 foundry and malleable at present is $15, Milwaukee furnace. At Chicago, furnace quotations are 50 cents a ton lower. Following recent heavy sales, the charcoal market is perceptibly firmer and it is doubtful whether any iron for third quarter could be obtained at $1.50, Chicago, at present. Southern foundry iron continues to show strength and $11.25, Birmingham, is now rather common for last half shipment.

Te following prices represent the market for Chicago delivery, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnaces.

	Third quarter.	Last half.
Lake Superior charcoal	$15.75	15.75
Northern foundry No. 2	14.50	14.50
Southern foundry No. 2	15.35	15.60
Southern silv'ries, 5 per cent sil.	16.10	16.35
Jackson co. silveries, 8 per cent	17.40	17.90
Malleable Bessemer	14.50	14.50
Alabama basic	15.35	15.60

Billets.—The market is comparatively bare of stocks, prices are firm and the demand for forging billets continues good. We quote, open-hearth forging billets, $28, Chicago; re-rolling billets, $24.

Merchant Bars.—The market for bar iron is appreciably firmer and the bulk of the business is now being taken at 1.25c, Chicago, the larger mills being well supplied with orders. Hard steel re-rolled from rails is also firmer, the minimum being 1.25c, Chicago, with a considerable tonnage moving at 1.30c. The Inland Steel Co. expects to start up its re-rolling mill at Chicago Heights this week. The mill has been shut down on account of a lack of rails. Having recently placed their contracts for soft steel the agricultural implement makers are now negotiating for their annual requirements of special steel, discs, etc. The demand for bars from stock is growing and mill specifications continue without abatement.

We quote, f. o. b. Chicago, as follows:

Bar iron, 1.25c; hard steel bars, rerolled, 1.25c to 1.30c; soft steel bars, bands and small shapes, 1.38c base; hoops, 1.48c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting 62 per cent off list for carload lots, 58 per cent off for less than carloads.

On iron and steel from local stock, we quote, as follows:

Bar iron, 1.50c to 1.60c per pound base; soft steel bars, 1.60c to 1.65c per pound base; soft steel hoops, 1.80c to 1.90c, full extras.

Structural Material.—The heavy run of car specifications which have been augmented by liberal orders from fabricators burden the local mills with a heavier tonnage than they have ever been called upon to handle before in their history. Deliveries are becoming somewhat slower as a consequence and some mills are offering nothing better than August 1 on orders placed at present. Prices continue very firm and it will not be surprising if an advance of $1 a ton were announced in the near future. Compared with the previous week's fabricating orders were light last week. The contract has been placed for the Second National Bank building, Toledo, O., which will require 2,377 tons of structural material. The American Bridge Co. has taken 131 tons from S. G. Courteen, Milwaukee, for a seed warehouse and the Indiana Bridge Co. has been awarded 148 tons by the United Coal Mining Co. for a coal storage and re-screening plant at Bucker, Ill.

We quote, mill prices, f. o. b. Chicago, as follows:

Beams and channels, 15 inch and under, 1.43c. For extras, see Pittsburgh report.

Store prices are as follows:

All angles, 3 inches and larger, including 6 inches, $1.70 to $1.75 per 100 pounds; angles over 6 inches, $1.75 to $1.80 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.70 per 100 pounds, base; channels, 3 inches and larger, $1.70 per 100 pounds, base.

Rails and Track Fastenings.—The local mills are busy with current orders. The Cambria Steel Co. has been awarded 2,000 tons of open-hearth rails by the Chicago, Milwaukee & St. Paul and 1,000 tons by the Monon. Specifications for track fastenings continue heavy and prices are firm, especially on spikes. Arrangements have recently been perfected by 19 western and eastern railroads with Chicago connections for increased inspection of rails at the mills and augmented staffs of inspectors have already been located at South Chicago and Gary, at the Pueblo mill of the Colorado Fuel & Iron Co. and also at the plant of the Algoma Steel Co.

We quote, light rails, f. o. b. Chicago, and track fastenings, f. o. b. Joliet, as follows:

Light rails, carloads, 25 to 45-pound, 1.20c to 1.25c; 16 to 20-pound, 1.25c to 1.30c; 12-pound, 1.30c to 1.35c; 8-pound, 1.35c to 1.40c.

Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; stand-

ard section relaying rails, subject to inspection, $23.50 to $24.

Track fastenings, f. o. b. Joliet, angle bars, 1.50c; railroad spikes, 1.55c to 1.60c, smaller size spikes, 1.65c, base; track bolts with square nuts, 1.95c to 2.05c base.

Plates.—The mills have such a large amount of business on hand that there is little prospect of the usual midsummer dullness overtaking the western plate market. In fact operating superintendents are wondering how they will get time for even a few days shut-down for necessary repairs, which are usually made in July. Following the heavy wave of car buying of the last few weeks the market has quieted down and orders are less numerous. The Louisville & Nashville has ordered 1,200 steel underframes divided as follows: Five hundred to the Pressed Steel Car Co.; 500 to the Mt. Vernon Car Mfg. Co. and 200 to the Bettendorf Axle Mill Co. The American Refrigerator Transit Co. has ordered 500 refrigerator cars from the American Car & Foundry Co. The Chicago, Milwaukee & St. Paul has purchased 25 sleeping cars, two observation cars and one smoking car from the Barney & Smith Car Co. and 20 coaches and 10 baggage cars from the American Car & Foundry Co. In addition to the underframe order mentioned above, the Louisville & Nashville is building 400 gondola cars, 500 box cars, 100 refrigerator cars, 100 flat cars and 100 stock cars in its own shops.

We quote, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6⅛ to 100 inches wide, 1.43c. For extras, see Pittsburgh report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, $1.70.

Sheets.—The irregularity which persisted following the advance in prices seems to be diminishing and quotations are more in harmony. The volume of business continues heavy and the local mills are provided with even more than they can conveniently take care of.

We quote, store prices, as follows:

Blue annealed, No. 10, 2.00c; No. 12, 2.05c. Box annealed, No. 28, 2.35c. Galvanized, No. 28, 3.45c.

For mill prices, see Pittsburgh report. Freight to Chicago, 18 cents.

Wire Products.—The western market is fairly firm on a basis of 1.60c, Pittsburgh, for wire nails and the irregularity which has been present is less evident. Jobbers are ordering heavily and their anxiety for shipments indicates that stocks throughout the country remain very low and that recent orders were for consumption.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.78; retailer's carload lots, $1.88; retailers' less than carload lots, $1.98; painted barb wire, jobbers' carload lots, $1.78; retailers' carload lots, $1.88; retailers' less than carload lots, $1.98, with 30c for galvanizing; plain wire, jobbers' carload lots, $1.58; retailers' carload lots, $1.63.

Merchant Pipe and Tubes.—Building operations in the loop district of Chicago are unusually heavy and the local demand for pipe has been stimulated. Prices are well maintained. Specifications are coming in more liberally and shipments are on a larger basis than for some time past. A much firmer tone is evident in the tube market. Specifications have improved and shipments increased, but the western mills could still handle more business.

We quote store prices on merchant pipe and tubes, f. o. b. Chicago, as follows:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
Butt.				
⅛ inch and ¼ inch.	71.2	50.2	63.2	42.2
⅜ inch	75.2	64.2	68.2	52.2
½ inch to 1½ inch..	78.2	69.2	71.2	59.2
Lap.				
2 inch	76.2	68.2	68.2	58.2
4½ inch to 6 inch..	77.2	68.2	69.2	60.2
Card Weight.				
7 inch to 12 inch...	74.2	63.2	67.2	56.2
Extra Strong Plain Ends.				
Butt.				
⅛, ¼, ⅜ inch.....	66.2	54.2	60.2	48.2
½ inch	71.2	59.2	65.2	53.2
2 inch to 3 inch....	76.2	64.2	....	....
Lap.				
2 inch	72.2	60.2	66.2	54.2
7 inch to 8 inch....	66.2	54.2	60.2	48.2
Double Extra Strong.				
Butt.				
½ inch	59.2	47.2	....	....
¾ inch to 1½ inch.	62.2	50.2	....	....
Lap.				
2 inch	60.2	48.2	....	....
4½ inch to 6 inch..	61.2	49.2	....	....
7 inch to 8 inch....	54.2	42.2	....	....

Tubes.

	Lap weld Per cent. steel.	Charcoal iron.	Shelby Per cent. seamless.
1 inch	39	..	57½
1¼ to 2¼ inch.....	55	40	35
2¾ to 3½ inch.....	65	50	46
3½ to 4½ inch.....	67½	50	46
5 to 6 inch.....	55	..	..

Cast Iron Pipe.—Prices on cast iron pipe continue firm, although there were but few contracts last week. The U. S. Cast Iron Pipe & Foundry Co. has contracted with the city of Cleveland, O., for its year's supply of water pipe, amounting to about 3,000 tons. Some fair-sized orders for railroad culvert pipe have been closed recently.

We quote, f. o. b. Chicago, as follows:

Four-inch water pipe, $27.00, 6 to 12 inches, $25.00, larger sizes, $24.50; gas pipe, $1 a ton higher.

Old Material.—The scrap market is strong and a number of items have advanced, especially re-rolling rails, shoveling steel and No. 1 railroad wrought. The latter is now quoted $12.75 to $13.25 per net ton and sales of shoveling steel have recently been made in the Chicago market on a basis of $11.75 per gross ton. Shipments are heavy, but the market seems to be able to absorb easily all of the scrap that is presented.

We quote, for delivery in consumers' yards, Chicago, as follows:

Gross Tons.

Old car wheels	$13.25 to 13.75
Old iron rails	16.50 to 17.00
Rerolling rails (5 ft. and over)	13.00 to 13.50
Old steel rails (3 ft. and under)	12.25 to 12.75
Frogs, switches and guards	12.00 to 12.50
Heavy melting steel	12.00 to 12.50
Shoveling steel	11.75 to 12.25

Net Tons.

No. 1 R. R. wrought	$12.75 to 13.25
No. 2 R. R. wrought	11.75 to 12.25
Arch bars and transoms	15.00 to 15.50
Knuckles, couplers and springs	11.50 to 12.00
Shafting	14.50 to 15.00
Iron car axles	19.00 to 19.50
Steel car axles	15.75 to 16.25
Locomotive tires	13.50 to 14.00
Dealers forge	10.25 to 10.75
Pipe and flues	9.00 to 9.50
No. 1 cast	12.00 to 12.50
No. 1 busheling	10.00 to 10.50
No. 2 busheling	7.25 to 7.75
No. 1 boiler cut	8.25 to 8.75
Boiler punchings	12.50 to 13.00
Cast and mixed borings	6.50 to 7.00
Machine shop turnings	7.25 to 7.75
Railroad malleable	11.50 to 12.00
Agricultural malleable	10.25 to 10.75
Angle bars, splices, etc., iron	13.50 to 14.00
Angle bars, steel	11.50 to 12.00
Stove plate and light cast scrap	10.00 to 10.50

Will Build Plant and Buy Machine Tools

The Saranac Machine Co., St. Joseph, Mich., expects to build a new plant at Benton Harbor, Mich. There will be a main building, 60 x 200 feet, part of which will be two stories. This will be of standard mill construction and will be equipped with a sprinkler system. The power plant will be housed in a wing.

The company will purchase a new 48 x 36-inch planer with either a 10 or 12-foot bed; additional drill presses, full universal radial drills and more lathes, together with additional equipment in the way of small tools. Part of the machine tools will be grouped for motor drive through shafting and others will be equipped with individual motors.

Hope to Retain Works.—Hoping to retain the plant of the Platt Iron Works, in Dayton, O., the chamber of commerce of that city is endeavoring to raise a fund of $450,000, of which $220,000 will be used to purchase the plant, under orders of the court, and the balance to be utilized for operating it.

CINCINNATI

Southern Situation Improves---Stocks Reduced

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg., May 14.

Pig Iron.—The southern situation has a better appearance than for some time, but it is not upon as firm a footing as some producers would like to have it. Inquiries are, as a rule, larger and better than for the past two weeks, but they are coming from territories which, according to the location of furnaces, would warrant them being placed in other cities. Some furnace interests here are viewing the market in a more optimistic manner than others, owing to the fact that stocks in their yards are being steadily reduced and that they have their outputs fairly well contracted for for periods extending in some cases well into the third quarter. Because of this, since they are not extensively soliciting business, prices with them are comparatively firm. On the other hand, there are others who are anxious to get business, and who do not, as a rule, hold the general quotations as firmly as the former. However, there is little business being done in this territory, partly because local offices have been limited in supplies allotted to them for sale, and also because the inquiries have been so few and small. This protracted lull has caused some dealers here to doubt whether present prices will hold, but the majority are strongly inclined to think that they will, if for no other reason than for the high prices of furnace coke, and the fact that a large number of melters in this territory have not as yet bought for their second half requirements. The prevailing price for southern foundry No. 2 is $11, Birmingham, for second quarter shipment, and from $11.25 to $11.50 for the last half. There is still a little iron scattered throughout the market that could probably be bought on a basis of $10.75, Birmingham, but hardly enough of it is left to have any effect. It is generally iron that was bought for speculation purposes when the prices were lower earlier in the year. One of the large Birmingham interests has withdrawn from the market and is refusing all quotations for the last half. The Virginia Coal, Coke & Iron Co. has entered the market for fourth quarter, and No. 2X is offered at $13.50 for that delivery, and $13 for the third quarter. Furnace stocks in Birmingham were reduced about 23,000 tons during the month of April, there being 106,431 tons on April 1 of this year, and 83,450 tons on the first of the present month. A year ago today there were 191,600 tons in these same yards, and on the first day of this year 141,000 tons. Malleable iron is selling in better quantities than for some time, and inquiries for gray forge are increasing and growing larger. The Ironton furnaces seem to be holding well together and are rather firm at $13.50 for southern Ohio foundry iron, but are not booking much business at this price. It is occasionally reported that some one in that territory has been cutting the market quotations, as several lots have been sold for less, but these cannot always be traced. It is generally known that certain northern furnaces have been bettering this price for some time. Inquiries in the market here include 1,000 tons each of Nos. 3 and 4 and gray forge to be delivered during June, July and August to a northern Ohio melter. A large Michigan manufacturer wants 500 tons of Virginia iron, 500 tons of northern and 100 tons of southern iron, and another in the same territory the same requirement of northern and Virginia grades, and 450 tons of southern, delivery in both cases to extend over the fourth quarter. A northern Tennessee user is also inquiring for 2,000 tons of gray forge and 1,000 tons of malleable, for third quarter shipment. With freight rates $3.25 from Birmingham, and $1.20 from Ironton, we quote Cincinnati prices as follows:

Southern foundry No. 2	$14.25 to 14.50
Southern foundry No. 3	13.75 to 14.00
Southern foundry No. 4	13.50 to 13.75
Southern gray forge	13.00 to 13.25
Mottled	12.25 to 12.50
Southern No. 1 soft	14.25 to 14.50
Southern No. 2 soft	13.75 to 14.00
Standard southern car wheel	25.25 to 25.50
Northern No. 2 foundry	14.70
Northern No. 3 foundry	14.20
Northern No. 4 foundry	13.95 to 14.20
Jackson co. 8 per cent silicon	16.70 to 17.20

Coke.—The coke market is a little unsettled, and dealers do not all agree as to prices. Furnace coke is in good demand, and quotations on all 48-hour brands are holding well, some contracts having been made lately ranging from $2.35 to $2.45. The inquiry for foundry coke, while fair, is not as good correspondingly, due partly to the fact that contracts generally for 72-hour brands do not expire until around July 1, and the buying movement is hardly expected before June. Foundries which stocked up fairly well with supplies when a coal strike was threatened some time ago, are beginning to buy again. There is a decided shortage of labor in the coke fields, and several interests which desire to start more ovens are unable to do so, being unable to get sufficient laborers to operate them. Several large buyers, who have refused to buy in any quantities for some time because of the high prices, have begun to sign contracts at market quotations. A northern Ohio manufacturer is inquiring for 125 cars of 72-hour brands. We quote as nearly as possible from the leading coke-producing districts, as follows:

	Prompt shipment.	Contract second half.
Connellsville district:		
Foundry coke	$2.60 to 2.90	$2.60 to 2.90
Furnace coke	2.35 to 2.45	2.35 to 2.45
Wise county district:		
Foundry coke	$2.50 to 2.75	$2.50 to 2.75
Furnace coke	2.00 to 2.25	*Sliding [scale basis
Pocahontas district:		
Foundry coke	$2.60 to 2.90	$2.60 to 2.90
Furnace coke	2.50	2.50
New river:		
Foundry coke	$2.50 to 2.75	$2.50 to 2.75
Furnace coke	2.25 to 2.40	2.25 to 2.40

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16 2-3 per cent of the amount over $9 which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material. — Business is generally reported better in practically all lines. Steel bars are being held at 1.20c and structurals at 1.25c, Pittsburgh basis, and local agencies report good contracts being made. The local sheet market is holding good, and the local mill is doing a continued good business with prices based as follows, f. o. b. Pittsburgh: Black sheets, No. 28, 1.95c, and galvanized No. 28, 3c. The contract for the new Gibson House, this city, will be let on May 20. The plans for the new Union station here, which call for from 150,000 to 167,000 tons of steel, are in the hands of a committee representing the railroads en-

tering this city, to be enacted upon. For prices, see Pittsburgh report.

Warehouse business has been better during the past week, and buyers seem willing to pay the recently advanced prices. Some fairly good specifications are being sent to dealers and closed for without much delay, showing that in some cases, at least, contractors are not carrying large stocks. We quote warehouse prices, f. o. b. Cincinnati, as follows:

Steel bars, 1.65c base; iron bars, 1.60c base; structurals, 1.75c base; plates, ¼ inch and over, 1.75c base; sheets, blue annealed No. 10, 1.95c base; rivets, cone head, 2.30c base; cold rolled shafting, 60 per cent discount; boiler tubes as follows: 1¾ to 2¼ inch, 60 per cent discount; 2½ inch, 62 per cent discount; 2¾ to 3¼ inch, 65 per cent discount; 3½ to 4½ inch, 67 per cent discount; and 5 to 6 inch, 60 per cent discount; soft steel cold twisted concrete bars, 60 per cent discount; soft steel cold twisted concrete bars, cut to length as follows: ¾ inch square and larger, 1.75c; ⅝ inch square and larger, 1.85c; ½ inch square and larger, 1.95c; 5-16 to ⅜ inch square and larger, 2.15c; ¼ inch square and larger, 2.25c.

Old Material.—There is practically no change in the scrap iron market, but the general tendency is towards a slight advance. Railroads are offering small lists, and the buying and selling movement has been a little better during the past few days. We quote below prices dealers will pay as follows:

Gross Tons.

Old iron rails	$12.75 to 13.75
Old steel rerolling	11.00 to 11.50
Old iron axles	19.25 to 19.75
Heavy melting scrap	10.25 to 10.75
Car wheels	10.50 to 11.00
Bundled sheet scrap	8.50 to 9.00

Net Tons.

Old No. 1 R. R. wrought	$10.25 to 11.25
No. 1 machinery cast	9.75 to 10.75
No. 1 busheling	8.25 to 8.75
Stove plate	7.00 to 8.00
Machine shop turnings	6.50 to 7.50
Cast borings	6.25 to 7.25
Heavy turnings	6.25 to 7.25
Mixed cast	8.00 to 8.75

CLEVELAND

Prices at Lake Furnaces Firmer

Office of THE IRON TRADE REVIEW,
Penton Bldg., May 14.

Iron Ore.—Weather conditions have not been favorable for the movement of vessels and the tonnage shipped has been small compared with other seasons of great activity, with which the present season is classed. It is expected that the shipments up to June 1 will be considerably less than for the same period in 1910. The ore on lower lake docks May 1, was 5,881,245 tons, a decrease of 969,040 tons compared with the amount on dock May 1, 1911. The rail shipments to furnaces during the winter season amounted to 3,250,419 tons. Very little ore is being sold, as furnaces are pretty well covered and sellers are not anxious to press sales at the present prices.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $3.75; Mesabi Bessemer, $3.50; old range non-Bessemer, $3.05; Mesabi non-Bessemer, $2.85.

Pig Iron.—There is fair inquiry and a goodly number of sales in rather small quantities. The prices are hardening, but Cleveland sellers find it difficult to obtain any higher prices than have recently prevailed. At Toledo, $13.50 is minimum on No. 2 foundry, and some sales have been made at $13.75. We quote, delivered in Cleveland, as follows, for the last half:

No. 1 foundry	$13.75
No. 2 foundry	13.25
No. 2 southern	15.35
Gray forge	12.75
Bessemer	15.15
Lake Superior charcoal	15.50
Jackson co. 8 per cent silvery	16.00

Coke.—The Toledo Furnace Co. has contracted for its coke requirements for the last half of the year for its second stack, which will be blown in this week. Fear of a strike in the anthracite region is again an important factor in the coke market. Prices are firm. We quote:

Connellsville furnace coke, $2.40 to $2.50 for prompt delivery. and $2.35 on contract; Connellsville foundry coke, $2.50 to $2.75 for prompt, and $2.50 to $2.75 on contract.

Finished Material. — Specifications on contracts for plates, shapes and bars continue heavy, but new business at the advanced prices is very light. Bar iron shows some improvement in demand, but not in prices. Demand for wire products continues strong. The leading wire interest has received heavy specifications and also considerable new business within a few days. The Second National Bank building, Toledo, 2,700 tons, and the Toledo Club, 500 tons, have been awarded to A. Bentley & Sons, of that city. Nearly all structural shops in Cleveland are well supplied with business, but no important structural contracts are pending. Nut and bolt manufacturers are running to full capacity and prices are stronger. Complaints of shortage of common labor continue.

Old Material.—More disposition to buy is being shown in this market, and while country scrap is coming into this city in tonnage lots yet it is all being absorbed. Prices have moved out of the rut of the past month and now tend upward. One local heavy steel consumer is in the market for heavy steel with an offer of $11.75 to $12, and the rolling mills are out for busheling at a slight advance. Tonnages offered on railroad lists which are now closing are fair. We quote, gross tons, f. o. b. Cleveland, as follows:

Gross Tons.

Old iron rails	$14.00 to 14.50
Old steel rails (under 6 ft.)	12.00 to 12.50
Old steel rails (over 6 ft.)	13.00 to 13.50
Relaying rails	19.50 to 20.00
Old car wheels	12.00 to 12.50
Old steel boiler plate	10.00 to 10.50
Malleable iron (railroad)	12.00 to 12.50
Steel axles	17.00 to 17.50
Axle turnings	9.50 to 10.00
Malleable iron (agricultural)	10.00 to 10.50
Heavy steel	11.75 to 12.00
Country mixed steel	9.00 to 9.50
Bundled sheet scrap	8.50 to 9.00

Net Tons.

No. 1 R. R. wrought	$11.50 to 12.00
No. 1 busheling	10.50 to 11.00
No. 1 machine cast	11.00 to 11.50
No. 1 dealers' wrought	7.50 to 7.75
Machine shop turnings	7.50 to 7.75
Pipes and flues	9.00 to 9.50
Wrought drillings	7.50 to 7.75
Stove plate	9.50 to 10.00
Cast borings	7.75 to 8.00
Wrought iron piling plate	14.50 to 15.00
Wrought iron arch bars	14.00 to 14.50

Have Better Plan.—The stockholders of the Westinghouse Machine Co., who were to have held a special meeting on May 9 to vote on a plan for re-financing that company, have postponed the meeting for three weeks, and the announcement is made that negotiations now pending will make the general plan much more favorable for the company, as more recent developments have improved the general proposition, both refinancing and increasing business. It is to complete these negotiations that the postponement of the meeting was made.

PHILADELPHIA

Pig Iron Stocks Reduced---Conditions Are Favorable

Office of THE IRON TRADE REVIEW,
Philadelphia, May 14.

Eastern conditions in iron and steel, on the whole, remain favorable. The mills continue to receive new business and specifications liberally and they are operating on a very satisfactory scale. Pig iron stocks on both steel works and merchant furnace yards are declining. Orders for pig iron on furnace books have increased, though the market is now quieter. There are still some variations in both finished material and in iron prices, but these are not extensive. Scrap buying is of less volume, but prices are generally strong.

Pig Iron.—New inquiry in this district has quieted down somewhat, and the volume of sales is not so heavy. There remain, however, considerable negotiations, the closing of which has been retarded in several cases through the strength shown by prices. Delaware river pipe makers are all in the market informally or on straight offers for low grade iron, but the scarcity of the latter, both in the north and south, is supporting a level of prices which these consumers are not willing to freely pay. Offers of $14.50, delivered this district, for round lots are in the hands of sellers, but the latter have not been able to put them through. For pipe iron of first grade, $14.75, delivered, this district, could probably be obtained. A Virginia pipe maker is inquiring for 3,000 tons of No. 3 and forge for third quarter. In basic, several buyers are still in the market for good-sized blocks, including a central Pennsylvania buyer which is seeking to cover for its third quarter requirements, aggregating from 10,000 to 12,000 tons. The price situation in forward basic is clearer following the sale of a round lot running through part of the third quarter to a leading eastern Pennsylvania consumer at $15, delivered, as reported last week. Since then, some additional selling for forward shipment has been done on the same basis. Some makers, however, will not go below $15.25, delivered. The recent purchases of one Harrisburg steel interest which have been reported on several occasions have been about 10,000 tons. The Oxford, N. J., furnace is going into blast this week on basic. This will be the first furnace in New Jersey to be active in a number of months. In foundry iron, though some sellers occasionally cut below this level, the bulk of the sales fall between $15 and $15.25, Philadelphia, for No. 2X. Lehigh and Schuylkill valley No. 2X is firm at about $14.75, furnace. For northern No. 2 plain, better than $15, delivered, has been obtained in some cases. The leading Virginia interest announced this week a price of $13.50, furnace, for No. 2X for straight last quarter orders, though it will accept $13.25, furnace, for last half. For third quarter, it continues to ask $13. Improved conditions, statistically, were shown for April by the reports of both the Virginia and the Eastern Pig Iron Associations, which met this week. In Virginia, the report was the most favorable for many months. Stocks showed a marked decline and orders a sharp increase from the preceding month. Virginia stocks are now at the lowest point in the year. The Pulaski furnace in Virginia has resumed. The furnaces in the eastern association reported some reduction in stocks, but orders were little changed. Some small lots of malleable have been sold in the Philadelphia district at unchanged prices. One consumer continues in the market for 1,500 tons of special Bessemer. Additional sales of low phosphorus, including one of 300 tons, are noted.

We quote for prompt and second quarter delivery in Philadelphia and vicinity, as follows:

Eastern No. 1X foundry	$15.25 to 15.50
Eastern No. 2X foundry	15.10 to 15.25
Eastern No. 2 plain	14.60 to 14.75
Standard gray forge	14.50 to 14.75
Basic	15.00
Virginia No. 2X	15.80
Southern No. 2	15.00 to 15.25
Standard low phosphorus	19.75 to 20.00

Finished Material.—Eastern mills continue to receive a considerable volume of new business and a liberal tonnage of specifications against contracts, and are producing at a heavy rate, with no marked variation in operations. Shortages of labor are still preventing the putting on of additional finishing mills in some cases. Price conditions on the heavier products are well maintained, though there is still a range of 1.20c to 1.25c, Pittsburgh, or 1.35c to 1.40c, Philadelphia, on plates and shapes. Plates appear stronger than shapes. Bars, both iron and steel, are quite strong.

The Chesapeake & Ohio railroad is having plans prepared for a large pier at Norfolk, Va., which is expected to require 8,000 to 10,000 tons of steel. The Southern railroad, which has been buying considerable material for the Lenor Car Works, Washington, as reported, has placed about 1,500 tons of iron and steel bars additional. Its recent purchases have amounted to 3,000 to 4,000 tons of shapes, plates and bars. Southern mills are credited with the bars, while two Pittsburgh makers received the shapes and plates. Plans are out and bids will be taken May 17 on a 13-story hotel for Harrington Mills, at Washington. The Murphy hotel, Richmond, Va., about 1,500 tons, will be bid upon May 22.

Open-hearth billets are in strong demand. Large consumers in the Pittsburgh district are inquiring of eastern makers for good-sized tonnages to cover shortages. Several eastern consumers are negotiating for round blocks and occasional inquiries from abroad are being received. Eastern makers are holding rolling billets at $2, Pittsburgh, and forging billets at $26, Pittsburgh, or $23.40 and $28.40, Philadelphia, respectively, but those prices could be shaded on attractive lots. Recent sheet advances are now being paid by eastern buyers. Wire products are not so active.

Price advances continue to be made on finished iron and steel products. Nuts and bolts have undergone an irregular advance and some business has been done at the new price. Chain quotations have gone up $2 a ton to 3.05c, Pittsburgh, for ⅜ inch. Some makers are now firmly quoting tin plate at $3.40, Pittsburgh, for third and fourth quarter. Standard railroad spikes are quoted at 1.40c to 1.45c, Pittsburgh.

We quote, delivered in Philadelphia and vicinity, as follows:

Plain structural shapes, 1.35c to 1.40c; tank plates, 1.35c to 1.40c; steel bars, 1.35c; common bar iron, 1.30c to 1.35c; cut nails, 1.65c to 1.70c; blue annealed sheets, No. 10 gage 1.55c to 1.60c; 4 x 4-inch open-hearth roll-

ing billets, $22.40 to $23.40; forging billets, $27.40 to $28.40. Extras shown under Pittsburgh report.

Ship Building Work.—Considerable tonnage of plates and shapes for ship building work pending or under contract, continues to be offered to eastern mills. Ship yards figuring upon the work have asked eastern makers for prices on the steel for four additional boats, each of which will require 3,000 tons of plates and a considerable quantity of shapes. The approximately 8,000 tons of plates required for the three additional American - Hawaiian boats awarded the Maryland Steel Co. are expected to be rolled by a central Pennsylvania mill.

Old Material.—Large lot buying of old material is less conspicuous, though the continued heavy rate of melting by eastern Pennsylvania open-hearth plants and the broader manufacturing activities of the mills of the district generally, give the market firm prices and a bullish outlook. One or two grades have eased off in price with lighter buying, this being notably true with borings and turnings. Wrought material is firm. Car wheels are being marketed at $14, delivered. First class No. 1 forge has brought $12.50, delivered. We quote gross tons delivered in buyers' yards in eastern Pennsylvania and western New Jersey, as follows:

Old iron rails	$16.50 to 17.00
Old steel rails (rerolling)	14.75 to 15.25
No. 1 heavy melting steel	13.50 to 14.00
Old car wheels	13.75 to 14.00
Old iron axles	23.00 to 24.00
Old steel axles	17.50 to 18.00
No. 1 railroad wrought	16.00 to 16.50
Wrought pipe	12.75 to 13.25
Cast borings	9.25 to 9.75
Machine shop turnings	10.50 to 10.75
Heavy cast	13.50 to 14.00
Malleable	11.75 to 12.25
Stove plate	10.50 to 11.00
No. 1 forge	12.00 to 12.50

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

NEW YORK

Spanish Ore Sold---Ferro Advances---Pig Iron Quiet

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg., May 14.

Iron Ore.—Additional sales of several cargoes of Spanish ore, amounting to 10,000 to 15,000 tons, have been made to eastern Pennsylvania furnaces on the basis of seven cents per unit, delivered, for the commoner grades. Sellers state, however, that it is doubtful whether much additional tonnage, if any, could be obtained on the seven-cent per unit basis, owing to the active ore demand abroad and the continued high level of ocean freights. There are inquiries pending in the east at present for about 25,000 tons of ore for which the furnaces are offering seven cents per unit for a dependable material, but this price appears to be more difficult to obtain. There is also some inquiry for low phosphorus ore at price offers which the sellers are unable to fill.

Pig Iron.—The pig iron market in the New York district rules quiet and the pending inquiry, aggregating but a few thousand, is made up of small lots. A New Jersey consumer has taken 500 tons of No. 1X and No. 2 plain for forward shipment and is reported to have purchased some of the higher silicon at close to $15.00, delivered, and the No. 2 plain below $15.00, delivered. The Delaware, Lackawanna & Western railroad has bought 300 tons of No. 1 iron for Scranton delivery and a railway equipment company, 600 tons of No. 2X for a western plant. A New England consumer has closed for 1,000 tons of Buffalo No. 2X for early shipment at $13.50, furnace. A leading buyer is inquiring for 600 tons of low silicon iron for Holyoke, Mass., delivery. Prices show strength and makers seem more determined to obtain higher levels for delivered products and in view of coke conditions. Lehigh and Schuylkill valley grades of No. 2X are quoted for delivery in this district and New England at $14.50 to $14.75, furnace, usually the latter. Some other eastern Pennsylvania makers will still do from $14.00 to $14.25, furnace, for No. 2X. Central Pennsylvania makers have been quoting No. 2 plain at $13.50, furnace. Buffalo iron is firm at a minimum of $13.50, furnace, for No. 2X and Virginia iron at $13.00, furnace, for No. 2X. An eastern consumer at a distant point closed for 5,000 to 7,000 tons of basic for third quarter shipment from an eastern maker at about $15.50, delivered. This price is about on an equivalent basis to eastern sales of basic that have been made for eastern Pennsylvania delivery. The Oxford, N. J., furnace is about to resume on basic and foundry. We quote at tidewater for prompt and second quarter shipment as follows, southern and Virginia iron being given at New York docks:

Northern foundry No. 1	$15.25 to 15.50
No. 2X foundry	15.00 to 15.25
No. 2 plain	14.75 to 15.00
No. 2 Virginia	15.80 to 16.05
No. 2 southern foundry	15.00 to 15.25
Malleable	15.25 to 15.50
Gray forge	14.50 to 14.75

Ferro-Alloys. — English makers of ferro-manganese have posted another advance of $2.00, effective May 10, which brings the present price level to $48.50, seaboard, for forward shipment. Makers have declined offers of business even at the advanced price. This is the third advance in the past several weeks. About the middle of April, the price was elevated from $41.00 to $43.50, seaboard, and on April 29 to $46.00, seaboard. The rapid advance in ferro-manganese is attributed to a combination of circumstances resulting from the curtailed operations of the furnaces during the recent English coal strike and to the interruption of ore shipments through the Straits of Dardanelles from Russia by the Italian-Turkish war conditions. Prompt ferro-manganese is soaring and prices vary with each transaction. Some sales were made in New York the past week at $50.00, seaboard, but it is doubtful whether they could be repeated. Some prompt material has been offered in the past few days at $53.00, seaboard. There is considerable inquiry for both prompt and forward manganese and probably 4,000 tons is pending, including one lot of 3,000 tons or more. Carload sales of 50 per cent ferro-silicon have been more numerous recently. We quote standard ferro-manganese for forward shipment at $48.50, seaboard, with premium prices ruling on prompt material, and 50 per cent ferro-silicon at from $68.00 to $70.00, Pittsburgh.

Cast Iron Pipe.—Eastern pipe shops are working on a more satisfactory schedule but some of them are still in need of considerable tonnage to en-

gage their capacity. The private lettings of the market remain active but there are few public proposals now coming out. Bids have been taken for two lots of 1,400 and 2,200 tons in contractor's lettings for Jersey City. We quote six-inch pipe at from $21 to $22, f. o. b., New York, in carload lots, some makers asking up to $22.

Finished Material.—There continues a very favorable tone to the finished market, which is based upon the liberal specifications now being entered and to a considerable amount of new business that is still coming out. The ability of eastern mills to make prompt deliveries is apparently gaining for them a larger and more diversified tonnage, owing to the heavily sold condition of the Pittsburgh district producers. Prices show a better degree of firmness, though shapes and plates still show a range of 1.20c to 1.25c, Pittsburgh, or 1.36c to 1.41c, New York. Plates are stronger than shapes and sales of attractive tonnages are noted on the 1.25c, Pittsburgh, basis. Bars, iron and steel, are firm.

The Carnegie Steel Co., effective May 13, advanced prices at its Waverly, N. J., warehouse, $2.00 a ton, bringing steel bars to 1.80c and plates and shapes to 1.90c at the warehouse. Other jobbers have duplicated the advance.

Open - hearth semi - finished steel is strong in price and the eastern market shows some good-sized sales and inquiries. A New England hardware manufacturer has closed a contract for about 5,000 tons with an eastern maker and another New England consumer has been inquiring for 10,000 to 15,000 tons. Open-hearth 4 x 4 rolling billets are quoted at about $23.00 to $23.50, New York.

The structural market shows a greater proportion of railroad inquiries and awards. The Boston & Maine has placed 2,000 tons with the American Bridge Co. for a bridge over the Connecticut river; the Western Maryland Railroad has given the Pennsylvania Steel Co. 1,700 tons for a number of bridges. The Delaware, Lackawanna & Western Railroad has placed 1,100 tons for arch centers in connection with the Tunkhannock & Martin's Creek viaducts. The Pennsylvania railroad has taken bids on a bridge over the Monongahela river near Brownsville, Pa., to require 2,500 tons and the New York, Ontario & Western has 1,500 tons for purchases pending. A bridge for the Hamden Street railway, between Springfield and Chicopee, Mass., 1,000 tons, is still pending.

Other lettings of the week include 8,000 tons to the American Bridge Co. for section 14 of the Lexington avenue subway under the Bronx river; 1,000 tons to Levering & Gerrigues for a terminal warehouse on West Twenty-seventh and Twenty-eighth streets; 600 tons to L. F. Shoemaker & Co., for an addition to the power house of the Philadelphia Electric Co. and 500 tons to the Richmond Structural Steel Co. for the Virginia Railway and Power Co. building, Richmond, Va. F. T. Nesbit & Co. has the general contract for the Glens Falls Life Insurance Co. building, Glens Falls, N. Y., 700 tons. All the bids received this week from the general contractors for the construction of the Eighth Artillery Armory and the alterations to other armories in New York City, requiring 8,000 tons to 9,000 tons, exceeded the appropriation and the plans will be revised.

Plans for the Biltmore Hotel, to be erected on the New York Central terminal site, this city, have finally been issued and bids will be taken May 21. This structure will require about 14,000 tons.

The Louisville & Nashville has placed 1,200 steel underframes, of which 500 went to the Pressed Steel Car Co., 500 to the Mount Vernon Car Mfg. Co. and 20 to the Bettendorf Axle Co. The Barbour Asphalt Co. has awarded the American Car & Foundry Co., 50 to 75 tank cars. The Newburgh & South Shore, a Steel Corporation road, is inquiring for 125 gondolas. The Norfolk & Western is about to distribute 65 steel coaches. We quote, delivered at New York tidewater, as follows:

Plain structural shapes 1.36c to 1.41c; tank plates, 1.36c to 1.41c; steel bars, 1.31c to 1.36c; common iron bars, 1.27c to 1.32c; bars from store, 1.80c; plates and shapes from store, 1.90c; extras as shown under Pittsburgh report.

Old Material.—New buying in old material is quieter and the leading consumers seem to be now filled temporarily upon their needs. In some lines, notably turnings and borings, prices are easier, but on the whole, quotations are very firm. We quote, gross tons, prices New York dealers will pay at tidewater, as follows:

Old car wheels	$11.25 to 11.75
Old iron axles	16.50 to 17.00
Old steel shafting	14.25 to 14.75
No. 1 heavy melting steel	11.00 to 11.50
No. 1 R. R. wrought	13.00 to 13.50
Wrought pipe	9.75 to 10.00
Cast borings	6.50 to 7.00
Machine shop turnings	8.00 to 8.50
Heavy cast	11.00 to 11.50
R. R. malleable	9.50 to 10.00
Stove plate	8.25 to 8.75
Grate bars	7.25 to 7.75

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York.

ST. LOUIS

Pig Iron Demand Quiet---Few Northern Iron Sales

Office of THE IRON TRADE REVIEW,
St. Louis, May 14.

Pig Iron.—The demand for pig iron in the St. Louis district has virtually subsided. Purchases have settled down to car load lots, and there are not many of them. Prices are firm at $11 for third quarter and $11.50 for fourth quarter shipment, Birmingham basis. Northern iron is in very light demand, and selling at $13.50, Ironton. Our tabulated prices on southern iron, delivered, to which the Birmingham freight of $3.75 has been added, follow:

Southern No. 1	$15.25 to 15.75
Southern No. 2	14.75 to 15.25
Southern No. 3	14.25 to 14.75
Southern No. 4	13.75 to 14.25

Coke.—Scarcely an inquiry for coke is in the market in the St. Louis territory, and prices are unchanged.

Finished Material.—Steel bars are quoted at 1.20c, Pittsburgh; plates and structural at 1.25c, Pittsburgh. Track fastenings are in good demand.

Old Material.—The most important sale reported last week was one by the Missouri, Kansas & Texas Railroad Co. of 820 tons of miscellaneous scrap. The market is dull, and prices are unchanged as follows:

Gross Tons.

Old car wheels	$13.50 to 14.25
Old iron rails	15.25 to 15.50
Re-rolling rails (5 ft. and over)	13.25 to 13.75
Old steel rails (3 ft. and under)	12.25 to 13.25
Light section relayers (45 lb. and under) subject to inspec.	21.50 to 22.50
Re-laying rails, subject to inspec.	22.50 to 23.25
Frogs, switches and guards	10.50 to 11.25
Heavy melting steel	11.50 to 12.25
Shoveling steel	10.75 to 11.25

Net Tons.

No. 1 railroad wrought	$11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Arch bars and transoms	14.25 to 14.50
Knuckles, couplers and springs	10.50 to 11.00
Shafting	14.00 to 14.50
Iron car axles	18.50 to 19.00
Steel car axles	16.00 to 16.50
Locomotive tires	11.50 to 12.00
No. 1 country wrought	9.25 to 9.75
Pipe and flues	8.50 to 9.00
Tank iron and cut boilers	7.50 to 8.00
No. 1 cut busheling	9.25 to 9.75
No. 2 cut busheling	6.35 to 7.55
Cast and mixed borings	6.25 to 6.50
Machine shop turnings	7.00 to 7.25
Railroad malleable	10.50 to 11.00
Agricultural, malleable	9.50 to 10.00
Stove plates	9.50 to 10.00
Angle splice bars (iron)	11.25 to 12.00
Angle splice bars (steel)	9.50 to 10.00

BIRMINGHAM

Sales Limited, But Prices Are Firm

Office of THE IRON TRADE REVIEW, Birmingham, Ala., May 14.

Pig Iron.—The tonnage placed in this market since last report is small comparatively, but without any apparent effect upon the views of the several producing interests in the matter of price. A leading producer continues to adhere to a basis of $11.50 per ton at Birmingham for any delivery in the last half, while with the other concerns, a basis of $11 per ton is very firm even for the small orders placed for spot shipment. The transactions reported for the week involve lots of 300 to 450 tons each, together with a fair volume of carload orders, all of which is for prompt delivery, and sold at the $11 per ton, Birmingham, schedule, for No. 2 foundry. A single lot of 250 tons of No. 3 foundry, for prompt shipment, sold at $10.50 per ton at Birmingham. The stock reports as of May 1 showed an accumulation of 140,000 tons of all grades on furnace yards in the state. This tonnage consists of 83,000 tons of free foundry iron, 14,000 tons of free basic iron, and 43,000 tons of foundry iron under warrant. Two furnaces were blown in on foundry iron during the monht of April, and one furnace additional is to be blown in at an early date. This last will be offset to some extent, however, by the proposed change of operations at another plant, where the output will be reduced some 125 tons per day. We quote the market as very firm, at the figures shown below:

For delivery prior to last quarter:	
No. 1 foundry	$11.25 to 11.75
No. 2 foundry	10.75 to 11.25
No. 3 foundry	10.25 to 10.75
No. 4 foundry	10.00 to 10.50
Gray forge	9.75 to 10.25
Mottled	9.50 to 10.00
Standard basic	10.75 to 11.25
Off basic	10.25 to 10.75
Standard charcoal	22.50 to 23.00

With the exception of charcoal iron, an advance of 25c to 50c per ton would be asked over the above figures for deliveries in the last quarter.

Cast Iron Pipe.—The leading interest is accredited with having just closed contracts involving an aggregate of some 11,000 tons of water pipe. The price consideration for the tonnage mentioned is not definitely known, but the requirements of St. Louis, Columbus, O., and Cincinnati, were provided for. In addition to this, a small tonnage has just been placed for requirements at Fayette, Ala., and for Horican Junction, Wis. Producers' asking prices are in all cases very firm, and represent an advance over the figures obtainable some few weeks since. Water pipe is quoted per net ton, f. o. b. cars here, as follows, viz.: 4-inch to 6-inch, $23; 8-inch to 12-inch, $22; over 12-inch, average $21, with $1 per ton extra for gas pipe. Special fittings are quotable from $45 to $50 per net ton at foundry, depending upon the size of requirement.

Old Material.—This market was without unusual developments within the past week. Considerable inquiry was received for wrought and steel grades, but the tonnage actually sold was small. Reports from all local grades represented locally as follows, per gross ton, f. o. b. cars here, viz.:

Old iron axles (light)	$12.50 to 13.00
Old steel axles (light)	11.00 to 11.50
Old iron rails (scrap)	11.00 to 11.50
No. 1 R. R. wrought	11.00 to 11.50
No. 2 R. R. wrought	10.00 to 11.00
No. 1 country	6.50 to 7.00
No. 2 country	6.00 to 6.50
No. 1 machinery	9.50 to 10.00
No. 1 steel	8.50 to 9.00
Tram car wheels	8.50 to 9.00
Standard car wheels	10.00 to 10.50
Light cast and stove plate	6.50 to 7.00

BUFFALO

Pig Iron Quiet---Prices Firm

Office of THE IRON TRADE REVIEW, Buffalo, May 14.

Pig Iron. — The market has been quieter during the past week than it has been since the early part of the current quarter, but nevertheless there seems to be an undercurrent of interest on the part of the consumers. Prices are being held firmly within the range given below. One interest refused $14.20, furnace, on a considerable order of malleable, and later secured the contract at $14.25. No. 2X has been sold as high as $14.50 during the week. The inquiry for the week is estimated at between 15,000 and 20,000 tons, and the sales between 15,000 and 18,000 tons.

The range of prices, f. o. b. furnaces, is substantially as follows:

No. 1X foundry	$14.00 to 14.50
No. 2X foundry	13.50 to 14.25
No. 2 plain	13.50 to 14.00
No. 3 foundry	13.50 to 13.75
Gray forge	13.25 to 13.75
Malleable	14.00 to 14.25
Basic	14.00 to 14.50
Charcoal	15.50 to 16.00

Finished Material. — Specifications continue to come in freely in practically all lines. There is not much new business, for most of the users are under contract for their requirements, but a buying movement is looked for as this quarter advances. Prices are being firmly maintained by all the mills, and there is talk of an additional advance of $1 a ton on bars, plates and shapes by the first of June. The mills have shown no inclination to open their books for last quarter requirements on the present market base, and with but a very few exceptions the contracts so far closed have been limited to third quarter for final delivery.

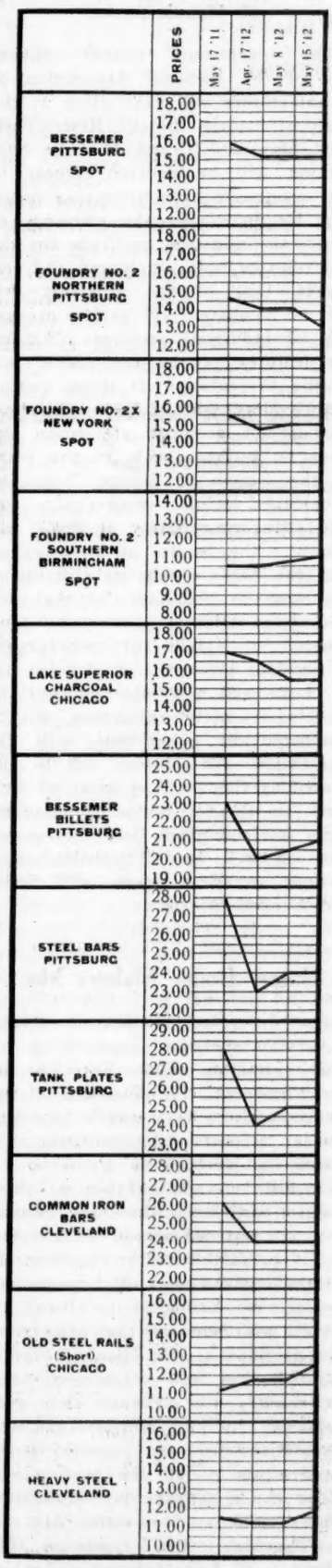
The mills supplying this section have apparently all they can handle. All of the interests have been forced to further extend deliveries — from four to six weeks on reinforcing bars, bars and structural and from six to eight weeks on plates. Tin plate has advanced to $3.40 base, on account of the scarcity of sheet bars and the prevailing price of pig tin. Another advance of 10 cents on chain has been made, ⅜ being quoted $3.05 base. The buying continues heavy on both wire nails and wire products with no changes in prices.

The Buffalo Structural Steel Co. secured the contract for the steel in the addition to the H. O. Co.'s factory, Buffalo, requiring about 250 tons. The Buffalo Gasolene Motor Co. will build an addition to its factory, requiring about 100 tons. No additional equipment will be installed, the addition being made to gain more room.

Old Material.—The market continues inactive. The trading done during the past week has been largely with consumers outside the district. The dealers are showing no disposition to cut prices to invite trade, their attitude being that stocks will soon be worked down so that the consumers will have to come into the market. The prices per gross ton, f. o. b. Buffalo are substantially as follows:

Heavy melting steel	$12.75 to 13.25
No. 1 railroad wrought scrap	13.50 to 14.00
No. 1 R. R. and mch. cast scrap	13.50 to 14.00
Old steel axles	16.50 to 17.25
Iron axles	21.00 to 22.00
Car wheels	12.50 to 13.00
Railroad malleable, scrap	12.50 to 13.00
Wr'ght iron and soft steel turn.	8.00 to 8.50
Cast iron borings	7.00 to 7.50
Low phosphorus steel scrap	15.75 to 16.00
Old iron rail	15.00 to 15.50
Tank iron	10.00 to 10.25
Boiler plate, sheared	13.75 to 14.25
Pipe and tank	9.50 to 10.00
Stove plate	9.75 to 10.00
Sheet iron	7.00 to 7.50
Locomotive grate bars	11.00 to 11.25

PRICE CHART



METAL MARKETS

Brisk Demand for Tin---Copper Now Active

New York

May 14.

Tin.—Consumers have supplied a good demand for the metal during the past week, particularly on Monday and Tuesday, notwithstanding the prevailing high prices. Sales of spot Straits tin were made in the outside market Monday at close to 47c. Today prices are slightly lower in sympathy with the decline of £1 in the London standard market, and the metal can be bought at from 46.50c to 46.75c for nearby delivery. Spot standard closed in London today at £211 10s and three months at £207. There is a great scarcity of Banca tin in the local market, and users of that brand have paid as high as 48.50c for June deliveries, recently. Arrivals since May 1 aggregate 1,620 tons and there are 1,810 tons afloat.

Copper.—It took several days for consumers to realize that the small increase in surplus shown in the Copper Producers' statement for April would not affect the price of the metal and up to Monday, only a moderate amount of business had been done. On that day, however, the demand became active and a large business has been done. Lake copper was freely bought at 16.12½c, cash, and electrolytic at 16.12½c, delivered 30 days. Both foreign and domestic consumers have participated in the buying movement which is still in progress, and has caused some sellers to advance quotations to 16.25c for both grades. At the close of business today lake is quoted at from 16.12½c to 16.25c, cash; electrolytic at from 16c to 16.12½c, delivered, and casting at 15.75c to 15.87½c. Exports of copper since May 1 are 11,008 tons. The London standard market closed today at £72 3s 9d for spot and £72 12s 6d for three months.

Lead.—The lead market has not shared in the improvement of other metal quotations. Independent sellers appear to have an accumulation of supplies and are the cheapest sellers at from 4.15c to 4.20c in New York. The American Smelting & Refining Co. continues to quote at 4.20c for shipments to this market.

Spelter.—Demand is good and offerings continue light. Prime western is firm at 7c in New York for May delivery. Some important producers are sold up for the next two months and are not disposed to quote very much below the spot price for futures.

Antimony.—The market is unchanged from last week and with a continuance of the light demand. Cookson's is 8c, Hallett's is 7.75c, and Hungarian is 6.75c to 7c.

Chicago

May 13.

New Metals.—Lead has weakened perceptibly. The prices on other metals are well maintained, although spelter sold off $1 a ton last week. The demand for copper remains fairly good. Tin is exceptionally strong.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Lake copper, carload lots, 16⅛c; casting, 15⅞c; smaller lots ¼c to ⅜c higher. Spelter, car lots, 6.65c; lead, desilverized, 4.20c in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, 8.65c, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 47c, Cookson's antimony, 8½c; other grades, 7½c to 8c.

Old Metals.—The old metal market is without features of interest and prices are moving within narrow limits. Copper and brass goods, together with aluminum, seem to be in better demand than the other old metals.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 14½c; copper bottoms, 13¼c; heavy cut crucible copper, 14½c; heavy red brass, 12½c; heavy yellow brass, 10c; No. 1 red brass borings, 11c; No. 1 yellow brass borings, 9c; brass clippings, 9¼c; lead pipe, 3½c; zinc scrap, 5c; tea lead, 4c; No. 1 aluminum, 12½c; No. 1 pewter, 28c; block tin pipe, 41c, tin foil, 35c; linotype dross, 3¼c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3¼c; prime slab zinc dross, $90 ton.

No Wage Change.—The bi-monthly settlement of the puddling scale was made on May 14, between the Amalgamated Association and the Western Bar Iron Association, on a 1.15c card, calling for $5.37½ a ton, the same rate as has been prevailing the past two months.

FIX DOCK CHARGES

Four Railroads File Tariff of 10 Cents a Long Ton.

Unloading dock charges at lake ports will be 10 cents a long ton, according to tariffs filed today with the Interstate Commerce Commission, by the Erie, L. S. & M. S., Pennsylvania Co., and the C., H. & D. railroads. It is possible that some of the other lines will make a rate as low as 7 cents. The question of a reduction from the 15-cent rate was considered for some time by roads in consultation with members of the commission, the rates under discussion varying from 7 to 10 cents. It is possible that when tariffs are filed by the other roads, the rate may be 7 cents. The Pennsylvania Railroad Co., the P. & L. E. and B. & O. have not yet filed their tariffs. While the commission has been consulted as to this decrease in charges, yet the new rates are subject to attack by shippers if believed to be too low.

The new rate by the Pennsylvania Co. becomes effective May 13, by the Erie on May 14, by the C., H. & D. on June 9 and the L. S. & M. S. on May 12, by special order of the commission. The Pennsylvania Co.'s notice of reduction was as follows:

"On iron ore arriving by a vessel at the ports of Cleveland, Ashtabula and Erie, Pa., and unloading by means of machinery and other facilities owned and furnished by the Pennsylvania Co., the charge against the vessel for taking ore from the hold of the vessel to the rail of the vessel will be 10 cents per ton of 2,240 pounds."

The new tariff published by the Lake Shore is as follows: McKeesport, Neville Island, Pittsburgh and Wylie, 96 cents direct and $1.04 from dock; Newcastle, Sharon, South Sharon and Youngstown, 56 cents direct and 64 cents from dock.

The customary 30 days notice of change in rates required by law was waived by the commission.

Reorganize Company

The Massillon Iron & Steel Co., Massillon, O., has been reorganized and the sale of $500,000 of preferred stock gives the company adequate funds on which to operate. C. M. Russell, who was at the head of the Russell Co. for many years, has been elected president and treasurer and will take an active interest in the business. J. R. Dangler, who has been associated with the company for many years, is secretary. W. C. Bruce, of the Bowler Foundry Co. and the Bruce-Macbeth Engine Co., Cleveland, is general manager. Eliot A. Kebler, formerly secretary of the Addystone Pipe & Steel Co., Addystone, O., and more recently resident agent at Pittsburgh for M. A. Hanna & Co., is sales manager and will have his headquarters in Chicago. The plant is in full operation, turning out hub and spigot, also flanged pipe, and castings and machine work. It has a capacity of 160 tons of finished castings per day.

ACCIDENT PREVENTION

Discussed at May Meeting of Chicago Foundrymen.

"The Prevention of Foundry Accidents" was the subject discussed at the regular monthly meeting of the Chicago Foundrymen's Club, held at the Great Northern hotel Saturday evening, May 11. President Wood opened the meeting with a few introductory remarks, in the course of which he sketched the scope and features of the new Illinois workman's compensation act and factory inspection laws.

A paper entitled "Suggestions for Preventing Foundry Accidents" was read by W. H. Cameron, manager of the casualty department of the American Steel Foundries. Mr. Cameron exhibited a large number of spectacles worn by chippers and floggers which had been damaged by flying pieces of metal; had these spectacles not been worn, the eyes of the workmen would have been injured in each case.

Dr. A. M. Harvey, physician for Crane Co., Chicago, also spoke on foundry accidents.

George H. Tompkins, attorney for the Chicago branch of the National Metal Trades Association, spoke on the legal aspects of accidents and pointed out some of the features of the new liability law. A. M. Thompson, foundry superintendent of H. W. Caldwell & Son Co., told of a number of practical safety appliances.

Light New Stack

Chicago, May 13.—The Iroquois Iron Co. today blew in its new D furnace at South Chicago. This is one of the two stacks which were completed last winter. It has a daily capacity of 300 tons and there is every prospect that its operation will be successful from the start.

The first shipment of ore this season for the Indiana Harbor plant of the Inland Steel Co. arrived May 14 on the steamer Leopold. She carried a cargo of 12,000 tons.

MOVING PICTURES

Will be a Feature of the Convention of Manufacturers.

The seventeenth annual convention of the National Association of Manufacturers will take place at the Waldorf-Astoria hotel, New York City, May 20, 21 and 22. The convention will be devoted largely to the enactment of constructive measures for improving the efficiency of American industrial methods by the education of both employers and employes. One of the problems that will be combated will be the prevention of industrial accidents. Among the features of the convention will be the presentation of three motion picture films. One of these will show the use of accident prevention devices on a large scale in the plant of the Brown & Sharpe Mfg. Co., Providence, R. I. Another film, entitled "Insuring Safety at Sea," will illustrate the results of investigation into the field of practical life-saving apparatus as promoted by the various trans-Atlantic steamship companies. An exhibit of photographs of accident prevention devices in use in plants and a number of working models of safety appliances will be conducted in connection with the convention. An address will be delivered by Charles A. Conant, of New York, on the relation of the Panama canal to commerce and transportation, as well as its probable effect on our American trade with South and Central America.

Master Boiler Makers Meet

The International Master Boilermakers' Association's convention began its sessions at the Fort Pitt hotel, Pittsburgh, on Tuesday of this week, and will continue through Friday. Reports of committees on various subjects to be discussed will be heard and action taken on about a dozen problems which the association will have before it. The various papers presented are arranged in the form of reports of committees. George W. Bennett, of Albany, N. Y., is president of the association, and presided at the opening session, and delegates from many sections of the country are present. They were welcomed by city officials, and representatives of the motive power departments of all the leading railroads. On Wednesday, committee reports took up the entire day, and on Thursday other reports of committees will be submitted.

Controversy as to Production of Old Contracts

Was a Feature of Tuesday's Session at Steel Corporation Hearing—Meetings to Discuss Prices After Gary Dinners

The Steel Corporation hearing at New York, Tuesday, developed the following testimony:

Jacob Meurer, a Brooklyn jobber of tin plate, testified that the American Tin Plate Co. had refused to sell him black plate for about two years after its organization. As a result, he was obliged to import plate at a higher cost.

James E. McFarland, of McFarland & Co., Philadelphia, dealers in and formerly dippers of tin plate, appearing Tuesday morning, stated that to obtain tin plate from the American Tin Plate Co., he had been forced to sign a contract whereby he assigned his brands to the latter company. He produced a letter from B. M. Stewart, sales agent of the American Tin Plate Co., in which the latter stated: "It is this company's intention to continue to furnish private brands subject to special arrangement." This arrangement, by the terms of an accompanying memorandum, provided that McFarland & Co., to do business with the American Tin Plate Co., must assign their private brands to the American Tin Plate Co. and to agree to purchase all their material from the former company. If the company purchased tin plate from any independent mill, it was to forfeit its brands. The witness stated he signed this contract, as at that time he could not secure material from plants not controlled by the American company. Later the terms of the contract were changed to require 90 per cent of the company's requirements to be purchased from the American company and later to 85 per cent. These contracts were originally drawn up in 1900 and continued until 1908. Under the contracts, the tin plate company allowed a rebate of 1 to 3 per cent of the purchase price. He said he did not think the competitors were willing to make a similar discount to get his business.

Howard M. Davis, Philadelphia sales manager for the Phillips Sheet & Tin Plate Co., who had been connected with the American Tin Plate Co., of Elwood, Ind., stated those most prominent in the organization of the American Tin Plate Co. were Daniel G. Reid, Judge W. H. Moore, F. S. Wheeler, J. A. Moore and the late W. B. Leeds. He thought the company controlled about 95 per cent of the production of the country when it was formed. Three months after its organization, the plan of assigning brands was inaugurated and soon about 75 per cent of the brands of the country was controlled. Discounts or rebates were first allowed in 1902 and continued until 1908, said the witness.

"Were there ever any meetings at Pittsburgh in 1907 at which representatives of the American Sheet & Tin Plate Co. were present?" asked Judge Dickinson.

"Yes," answered the witness.

"Who were present?"

"E. T. Weir, of the Phillips Sheet & Tin Plate Co., as I recollect, was chairman of the tin plate meetings and James Campbell, president of the Youngstown Sheet & Tube Co., Youngstown, O., of the sheet steel meetings. Other companies represented included the American Rolling Mill Co., the Inland Steel Co., etc."

"What transpired at these meetings?"

"We discussed prices and the representatives of each company would announce their price."

The witness stated that sometimes the companies would not adhere to these announced prices. "We would then investigate the matter and hold a meeting at which an explanation would be asked of the company which was underselling."

"What was the usual explanation?"

"That it was a mistake."

"Who appointed Mr. Campbell chairman?" inquired Judge Dickinson.

"I do not know."

"Did Judge Gary?"

"I do not know."

"Who appointed Mr. Weir?"

"Mr. Campbell did."

"Did those meetings at Pittsburgh follow the Gary dinners which were held in New York?" asked Judge Dickinson.

Mr. Lindabury objected to this question on the ground that it was "irrelevant, incompetent and improper". Mr. Dickinson, however, insisted on a reply.

"As a rule they were held right after these dinners," said Mr. Davis. "Within a week after, I should say."

In further cross examination, Mr. Davis laid emphasis upon the fact that no price agreements were made at the Pittsburgh meetings, but that the various manufacturers after announcing prices as a usual thing adhered to them.

William E. Reis, former president of the National Steel Co., but now retired, was examined by Judge Dickinson.

"Didn't you recently refuse to give information to government counsel " asked Mr. Dickinson.

"I did," replied Mr. Reis.

"I'm glad to hear you say that," interjected Mr. Lindabury.

"None of your cows seem to be letting down much milk," retorted Mr. Dickinson.

A good portion of Mr. Reis' examination was devoted to the various competing companies which existed at the time of the formation of the National Steel Co. Mr. Reis stated that he had founded the Shenango Valley Steel Co., the stock of which he later exchanged for stock in the National Steel Co. The latter concern, the witness stated, sold most of its products to the American Sheet Steel Co., the American Steel Hoop Co. and the American Tin Plate Co.

Carlo V. Wheeler, secretary and treasurer of the American Sheet & Tin Plate Co., and formerly connected in the same capacity with the American Tin Plate Co., the next witness to be called, was questioned about numerous papers and records of contracts.

"Do you know of any contracts drawn up with manufacturers of rolls, housings, etc., by which either the American Tin Plate Co. or the American Sheet Steel Co. secured their entire output?"

"There might have been such contracts but I have no record of them," replied the witness.

"Were any contracts ever drawn up which provided that those makers of such machinery who sold to the American Sheet & Tin Plate Co. should not sell to independent concerns?" pursued Mr. Dickinson.

"I don't know," replied the witness. He was asked if he remembered a contract dated Jan. 12, 1904, between the American Tin Plate Co. and the American Can Co. This he had no memory of.

"Do you know of a contract entered into by the American Sheet Steel Co. and several independent

companies whereby the former agreed to take over the output of the latter for a term of five years?" asked Judge Dickinson.

"I do not," answered Mr. Wheeler.

Judge Dickinson asked the witness if he knew of a contract for sheets entered into by the American Sheet & Tin Plate Co. and the American Can Co. Mr. Lindabury interposed, stating that there were records of two such contracts in existence, but that they would not be produced except on an order from the court. His refusal was based on the ground that they were irrelevant.

Mr. Wheeler stated that it was his habit to destroy obsolete papers from time to time and that the documents which the government desired were probably no longer in existence. Judge Dickinson was plainly displeased and ordered the witness to make careful search for the papers.

John A. Topping, chairman of the board of directors of the Republic Iron & Steel Co., first vice president of the American Sheet Steel Co. for three years, and formerly at the head of the Aetna Standard Iron & Steel Co., which sold out to the American Sheet Steel Co., was called to the stand by Judge Dickinson and subjected to a line of routine questions.

(A report of the proceedings from Wednesday afternoon of last week to and including Monday of this week will be found on pages 1070-1076 of this issue.)

Will Blow in Vanderbilt Stack

Birmingham, Ala., May 15. (By wire.)—The Woodward Iron Co. has begun repair work on Vanderbilt No. 2 furnace, which was formerly owned by the Birmingham Coal & Iron Co. This stack is of 300-ton capacity. The company expects to have it in operation within the next 35 or 60 days, which is about the time required to make necessary repairs.

Ratify Bethlehem Issue

New York, May 14. (By wire.)—Stockholders of the Bethlehem Steel Co. today ratified the issue of $50,000,000 in bonds, of which $15,000,000 are refunding bonds and the balance will be kept in the directors' hands for future development.

Announcement is made that the Bethlehem Steel Co. has made a five-year contract with the American Locomotive Co. to furnish 1,000 tons of steel castings a week. The agreement becomes effective July 1.

PRICES ADVANCED

In Nuts and Bolts—The New Schedule of Discounts.

A general advance in prices has been announced by nut and bolt manufacturers effective May 11. The amount of the advance varies according to the grade of product, but it reaches several dollars a ton in some cases. Considerable business has already been done by the manufacturers on the new price basis. The revised schedule of prices on lots of 300 pounds or more and within a freight zone of 20 cents from the seller's plant is as follows:

Small carriage bolts, cut thread, 80 and 10 off.

Small carriage bolts, rolled threads, 80 and 17½ off.

Large carriage bolts, 75 and 12½ off.

Small machine nuts, cut threads, 80 and 15 off.

Small machine nuts, rolled threads, 80, 20 and 2½ off.

Large machine bolts, 75, 10 and 10 off.

Square hot-pressed nuts, blank or tapped, $6.50 off.

Hexagon nuts, $7.40 off.

TAKES OVER DOCK

Pickands, Mather & Co. to Operate Ashtabula Dock.

The Ashtabula & Buffalo Dock Co., a Pickands-Mather Co. corporation, will hereafter operate the Superior dock, at Ashtabula, formerly operated by the Pittsburgh & Conneaut Dock Co., on behalf of the Steel Corporation. E. O. Whitney will be the superintendent. The old dock No. 2, formerly operated by the Ashtabula Dock Co., and equipped with 12 Brown hoists, will be discontinued. The ore now on it will be transferred to the Superior dock. The Superior dock was extended a few years ago and equipped with four 15-ton electric Huletts and conveying bridge. The old portion of the Superior dock has six Hoover & Mason unloaders and ten Brown hoist machines and will probably undergo some changes in equipment.

Institute Meeting to be Largely Attended

Indications point to a large attendance of iron and steel manufacturers at the second general meeting of the American Iron and Steel Institute to be held in New York City, Friday and Saturday, May 17 and 18. Acceptances from about 175 for the banquet to be held at the Waldorf-Astoria, Friday evening, have been received and it is expected that this number will be increased to fully 200. Arrangements have been made for inspection trips to be made about the city on Saturday by the visiting manufacturers, but these will be very informal in nature and will be left to the wishes of the individual steelmaker. Among the places to be visited will be the terminal improvements of the New York Central railroad, the main power station of the Interborough Rapid Transit Co. and the Fifty-ninth street power house of the New York Edison Co.

Death of George A. McDougall

George Allan McDougall, sales manager at St. Paul, Minn., for the Carnegie Steel Co., Illinois Steel Co., and Tennessee Coal, Iron & Railroad Co., died May 7, from pneumonia, aged 66 years. Mr. McDougall had represented the Carnegie Steel Co. for more than 20 years, and several representatives of the company were among the pallbearers.

Prof. Nathaniel Walter Shed died in Buffalo, May 3. He was for nearly 30 years identified with the iron and steel business of this country as a metallurgist and chemist. At the time of his death, he held the chair of metallurgy in the University of Buffalo, and was chemist of the Buffalo Foundry & Machine Co.

Invited to Inspect Engine

Mackintosh, Hemphill & Co. have issued invitations for an inspection of a new three-cylinder compound, direct-connected reversing engine, which has just been completed at their works in Pittsburgh for the Algoma Steel Co. The inspection will be held on Monday, Tuesday and Wednesday of next week. Much interest is being taken in this completed machine, as it represents the very latest ideas in reversing engines for heavy duty mill work.

The officials of Mackintosh, Hemphill & Co. will receive the visitors during the three days of the inspection.

Accident at Norrie Mine

Seven men were killed and six others entrapped at the 2,000-foot level of the Norrie iron ore mine at Ironwood, Mich., in the Lake Superior region, by a cave-in on the night of May 13.

A Continuation School for Shop Apprentices

How Cincinnati Machine Tool Builders Supplement Shop Work With Technical School Training

A new type of industrial school that embraces all of the fundamentals of similar co-operative institutions of learning, but which applies them in a different manner, is found in the Continuation School for Apprentices, in Cincinnati. The principle applied in all of the other corresponding courses that have been founded in that city is that the school and the shop be brought into closer connection with each other so that the students can be given practical machine shop practice along with their studies. In the continuation school, however, the system is reversed, and the apprentices in the different machine shops throughout the city are taught the theoretical side of their work at the same time that they are engaged with the practical.

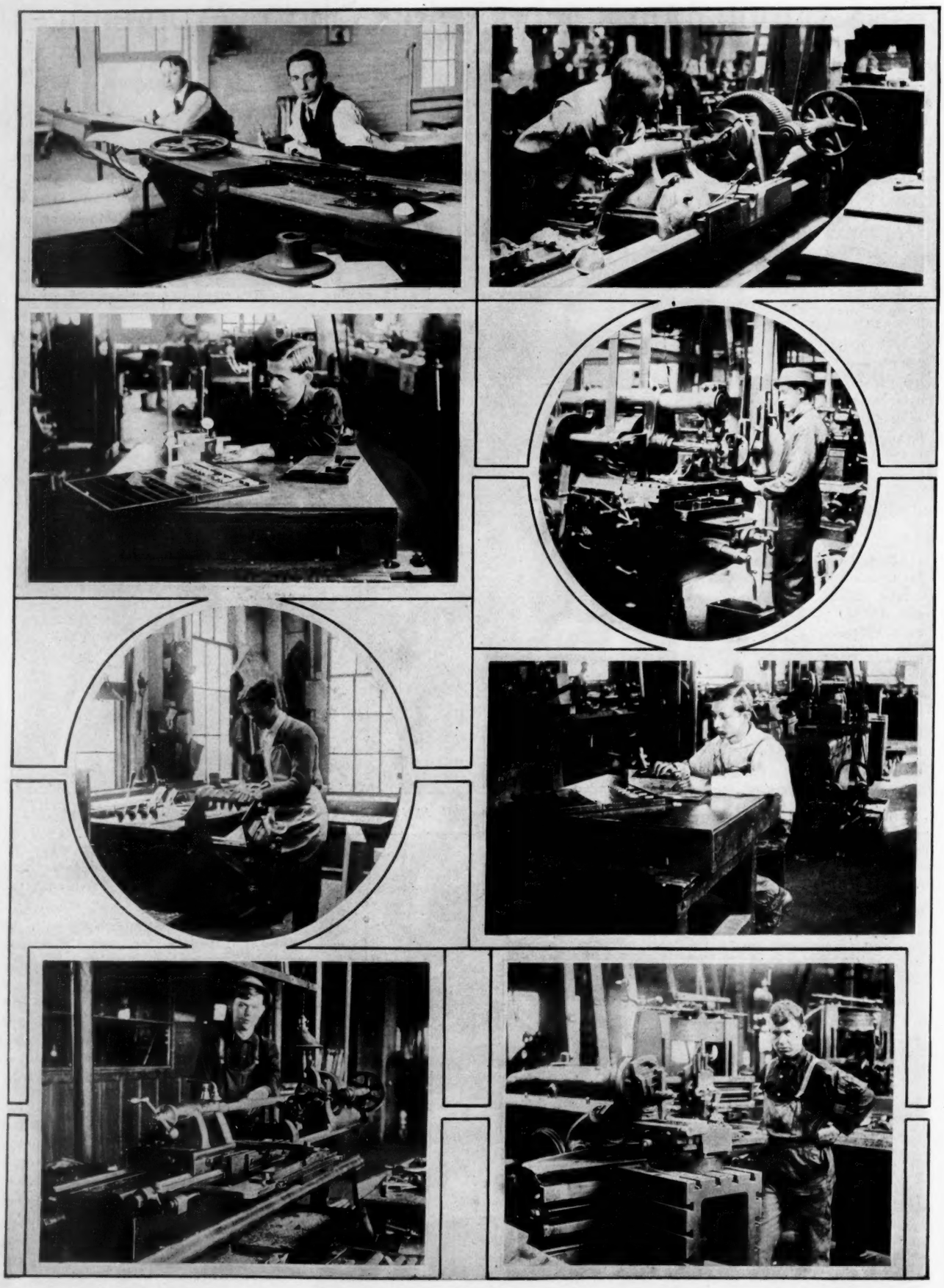
There has been a prevailing feeling for years, among Cincinnati manufacturers, of the need of a greater number of technically-trained mechanics, and it was believed that the general efficiency of their establishments would be greatly increased if their apprentices could in some way become interested in the technical details of their work. About two years ago, therefore, with this sentiment in mind, the officials of two of the leading manufacturing firms in the city devised a plan to engage a teacher having a practical as well as a technical knowledge of shop work, who would be able, without the aid of text books, to convey to his pupils the technical knowledge necessary to solve the mechanical problems that would present themselves in the shop. Two hours were then set aside twice a week for these beginners to receive instruction, the school at first being held in the shops where the apprentices worked.

By the end of the two years referred to, the school had ceased to be an experiment, and had attracted so much attention from other Cincinnati manufacturers that there was a demand for a more elaborate working-out of the plan. The matter was taken up with the Cincinnati board of education and an agreement was reached whereby the city was to provide the necessary teachers, building, equipment and pay the general expenses for such a school, thus placing it under its direct jurisdiction, and the manufacturers agreed to enroll a sufficient number of apprentices to justify its establishment. Upon this proposition, then, the Cincinnati continuation school was founded, being at that time the first of its kind in the United States.

AN ADVANCED CLASS OF APPRENTICES

A CLASS IN ELEMENTARY DRAFTING

The cost of the school is approximately $4,000 a year. The manufacturing concerns interested in its establishment and continuance are as follows: J. A. Fay & Egan Co., R. K. LeBlond Machine Tool Co., Cincinnati Milling Machine Co., Lodge & Shipley Machine Tool Co., American Tool Works Co., Cincinnati Bickford Tool Co., J. B. Morris Machine Tool Co., John S. McGowan Co., Cincinnati Planer Co.,



APPRENTICES ENGAGED IN SHOP WORK

J. & E. Greenwald Co., Oesterlein Machine Co., Bradford Machine Tool Co., J. A. Day Co., Heisey-Wolf Machine Co., Mueller Machine Tool Co., Van Wyck Machine Tool Co., Steptoe Shaper Co., and the Ahrens-Fox Engine Co.

The school occupies an entire floor in the second intermediate school building, on Ninth street, between Main and Walnut streets, and includes a machinists' class and lecture room, a printers' class and lecture room, a club room, a chemical and physical laboratory, and a blue printing room with a dark room attached. Two teachers are employed, both well known in technical education circles in Cincinnati.

The attendance averages approximately 250 pupils a week, who come in groups of about 30 each. The apprentices from the machine, pattern-making and drafting departments are treated as one and are divided into nine sections, each spending one-half day or four hours in the school each week. The classes are arranged so that the more immature come at the beginning of the week and the advanced students the latter part of the week. The educational capacities of the apprentices range from several who could not read the ordinary second reader lessons to those who have finished a regular high school course.

The apprentices are paid their usual wages for attendance by their employers, which are deducted accordingly when they are absent or late. A report of the school is made to the employers each week, in time for the pay rolls.

New members are admitted to all classes when necessary, and some new pupils are admitted each week. The migration from the trades is heavy, and this has, until this year, left room for the newcomers. One of the first efforts of the school, however, is directed to the holding of the apprentice to the trade until he has become immune to the environment and possibilities offered through it.

Apprentices are taken without question as to their previous training, their acceptance as an apprentice in the shop being the only requirement for admission and some of the shops do not make any discriminating requirements. The school operates 4 1/2 days a week, beginning on Monday and finishing on Friday, for fifty-two weeks a year. Two additional half days are given the teachers to visit the shops, see the boys at work, talk to the foremen and to gather material for the courses of study.

The course, which covers four years, corresponding to a term of apprenticeship, comprises the following subjects:

First year. — Shop arithmetic, spelling, reading, composition, reading blue prints, drawing, geographical relations of the shop materials, and civics.

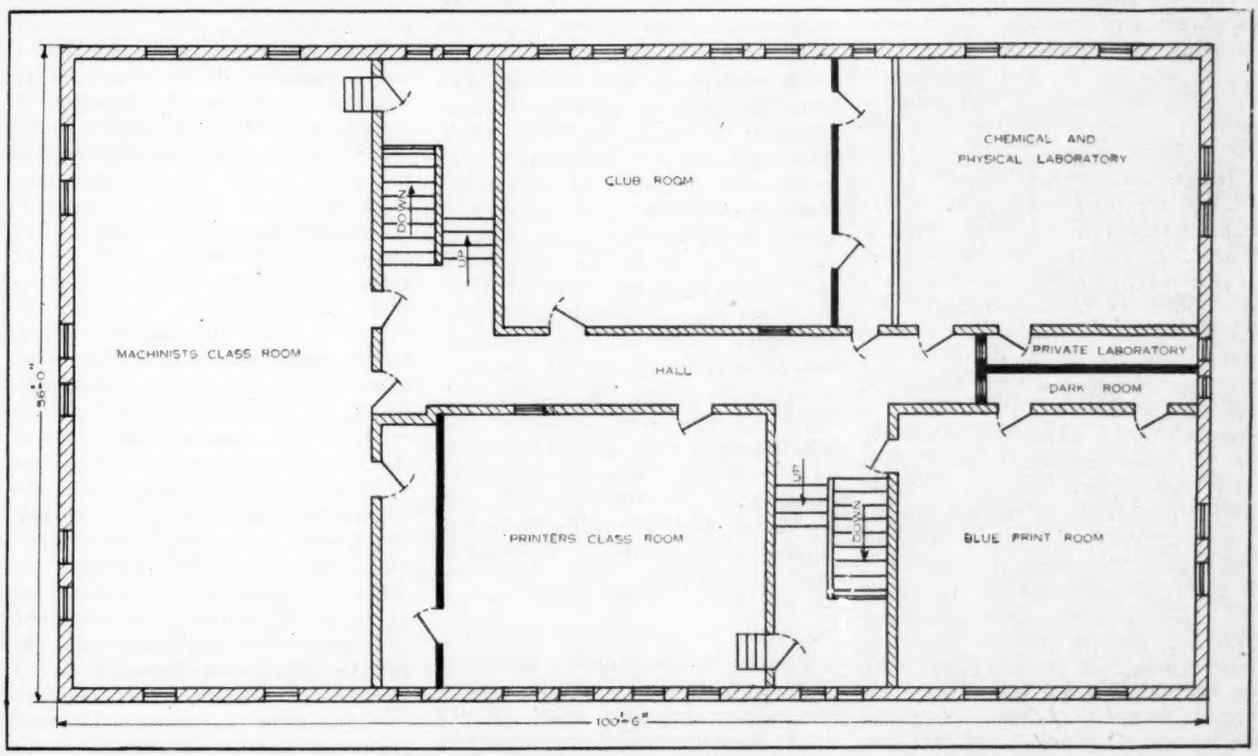
Second year. — Objective geometry; science,—iron, its manufacture and founding; blueprints, mechanical and freehand drawing; shop practice,—shop conventionalities and necessities; civics, and the reading of the lives of the world's improvers.

Third year—Geometry and algebra, physics, shop practice, foremen's question box, drawing, civics and economic history and literature.

Fourth year — Trigonometry and applied mechanics; shop chemistry; shop practice — visiting industrial plants and discussing observations, especially of economy and waste; culture—the man as a wage earner and citizen; debates.

A lesson consists of starting without the real object for discussion in the class room, and by means of a graded set of symbols to gradually make the pupil see the object by the use of his imagination. When an apprentice can see a machine work before him without actually having it there, the object of the lesson has been accomplished and he has learned to think better.

In addition to classes for apprentices in machine shops, instruction is also given to apprentices in the different printing establishments in the city, this new feature having been lately added, when the results of the school for machinists began to show. Its operation is similar to that of the other, the apprentices spending Thursdays in the class room from



PLAN OF CINCINNATI CONTINUATION SCHOOL FOR APPRENTICES SHOWING THE ARRANGEMENT OF THE CLASS ROOMS AND DEPARTMENTS

7:30 to 11:30 a. m., and from 1 to 5 p. m. For this time, as in the case of the mechanical apprentices, they are paid by their employers, to whom weekly reports of attendance are mailed. Saturday morning is spent by the instructor in the various shops, gathering material for the class room work. About 50 boys are enrolled in this school, and are under the care of a single instructor well versed in all the details of the printing trade.

The continuation school as a whole has attracted considerable attention among manufacturers throughout the country, and it is being inspected almost weekly by representatives from different plants. As a result, several schools, based upon the methods employed by this one, have sprung up in different parts of the country, and many more are being seriously considered.

Recent State of Steam Turbine Development

By A. G. Christie

Continued from page 1013, May 9, issue of THE IRON TRADE REVIEW.

Thrust bearings are now provided on all types of turbines. These serve to adjust the position of the spindle and to take up any end thrust present. The end thrust in well designed turbines is usually of small amount and seldom causes trouble. These bearings are usually flooded with oil and are often made with bronze rings which can easily be replaced in case of damage. Several builders of the Curtis-Parsons turbines have substituted an oil thrust piston for the steam balance piston of the usual form. This piston is placed on the governor end of the shaft outside of the casing proper. The thrust is taken up by oil which is supplied under pressure and which can escape only through sets of labyrinth baffles on the piston and on the surrounding chamber. The piston adjusts itself for the amount of thrust present by a small axial movement of the shaft, thus opening or closing the discharge area for the oil through the labyrinth baffles, and automatically varies the oil pressure on the face of the piston.

The speed of Parsons turbines is usually controlled by a centrifugal governor of the Hartung or similar type which regulates the position of a balanced poppet valve through the medium of a steam or oil relay. The latter type is coming into more general use on account of its many advantages over the steam relay. The steam is throttled either at constant pressure or by a pulsating action.

Impulse turbines and turbines employing a Curtis high-pressure ring usually govern by means of Hartung type governors and oil relays. The speed is sometimes controlled by simple throttling of the steam, which practice is common in Europe. In this case, additional nozzles can be opened or closed by hand as required. Other types employ both throttling and automatic nozzle regulation, while, again, many turbines, particularly of the Curtis type, are built for nozzle governing alone.

All turbines are now provided with a small overspeed governor, usually placed at the outside end of the shaft. This operates at a determined percentage over speed and closes the main or secondary steam valve either by means of a steam or oil relay or by a falling weight through a system of levers and springs. The oil relay system has the advantage that the valve shuts immediately should the oil supply fail for any reason.

Parsons turbines are usually provided with a secondary overload valve which automatically admits live steam to the second diameter of blades. Impulse turbines have additional sets of nozzles with valves which may be opened automatically, or by hand in case of overloads.

Casings

Practice varies widely in regard to the construction of turbine casings. These are generally made of cast iron, though some European builders make the high-pressure front end of cast steel. Parsons turbines are built with the top and bottom halves single castings or made in sections. Some of the older designs of impulse turbines used solid diaphragm plates placed on the shaft between the disks. The clumsiness of handling and the difficulty of making repairs with this construction has forced most builders to make these in halves and to fasten them to the top and bottom portions of the casing.

Cylinder casings are now made of symmetrical design and without any deep metal webs or ribs as stiffeners on the outside. Equalizing pipes with provision for expansion take the place of passages formerly cast in the casings themselves. Strains due to unequal temperatures must be avoided in all portions.

When steam turbines are to be installed at high altitudes, as in many locations in the west, the effect of altitude on economy frequently comes up. It can be easily shown that with the same boiler pressure and the same absolute pressure in the condenser, the steam consumption of a turbine at 5,000 feet elevation should exceed that of a similar turbine at sea level by less than 1 per cent.

Each turbine is designed to operate at maximum efficiency at some given vacuum. Owing to uncertainties in design factors for losses and to slight inaccuracies in construction, the most efficient vacuum may vary somewhat from that for which the turbine was designed. Theoretically, the steam consumption should decrease as the vacuum increases, but this rate of decrease will vary for each type of turbine, depending on the blade areas and steam velocities of the low-pressure section. It is, therefore, essential that this rate of change be determined for each individual turbine by actual test.

In the purchase of steam turbines, operating efficiency and costs should be considered together with first cost, and the machine selected should be the one on which the ultimate operating and fixed charges are a minimum. This practice is followed in Europe. In America the bargain-counter idea unfortunately possesses many engineers, and manufacturers have frequently been forced to sacrifice efficiency in order to meet competition.

The efficiency of a steam turbine may be expressed in terms of pounds of steam per kilowatt hour, as an efficiency ratio or as the British thermal unit required per kilowatt hour. The steam consumption is dependent on the initial steam pressure, its temperature or quality, and the con-

denser pressure. These factors vary in almost every test and the effect of a variation in each is not the same for all classes of turbines. Hence, different turbines cannot usually be compared satisfactorily on the basis of their steam consumption alone.

The British thermal unit per kilowatt-hour is figured above the heat of the liquid at exhaust pressure. This is not a satisfactory standard by which to compare results, for it is largely dependent on conditions beyond the control of the turbine builder. For instance, if the plant does not contain superheaters, the British thermal unit per kilowatt-hour will be high. The same will be true of a plant which has a warm cooling-water supply for condensers and consequently carries low vacuum. Yet the turbines may be designed to give a high efficiency ratio under these conditions. In fact, they may be able to utilize the heat available more efficiently than the turbines in another plant with both high superheat and high vacuum.

Low and Mixed-Pressure Turbines

Many low-pressure turbines have been erected since 1904 and have shown very economical results. In some installations it is usual to provide for operation on high-pressure steam when the supply of exhaust steam is insufficient to meet the power demand. Hence, the mixed pressure turbine has been developed. In Europe a Curtis stage is added at the inlet and the live steam passed through this before entering the low-pressure section. The whole of the heat content of the live steam can be effectively utilized by this method. Bleeder turbines are also being built, in which, after partial expansion to some fixed pressure, a portion of the steam is withdrawn from the casing for heating or industrial purposes.

Low-pressure turbines are frequently installed to use the exhaust steam of reciprocating engines without regenerators. In this case the generators are sometimes tied together electrically and the turbines are only fitted with an overspeed governor. Such turbines are usually installed in stationary work, only when the reciprocating engines are already in service. The high-pressure turbine in a new plant requires less floor space, has less complicated machinery, is cheaper in first cost and in maintenance, and approaches, if it does not equal, the economy to be derived from the combination unit in every-day service. It is probable that low-pressure turbines will be installed in the near future in large gas engine stations to utilize the waste heat in the gas engine exhausts.

Turbo-compressors are built either with curved or radial impeller blades which discharge the air into smooth expanding diffusor channels to convert the velocity energy of the current into pressure. Usually guides are provided to direct the air into the entrance of the next stage without eddies. All passages are made as smooth as possible with no abrupt bends or turns, and all walls are water-cooled. The air is prevented from leaking back from stage to stage by labyrinth packings such as are used in impulse turbines.

Turbo-blowers have also been built to deliver large volumes of air at low pressure, such as are required in furnace work. These units have no water-cooled jackets. The first difficult problem encountered in the construction of turbo-blowers or compressors was the provision of a suitable governing device for the unit. However, several ingenious and satisfactory arrangements have recently been developed and it is probable that this difficulty will soon be overcome completely.

The efficiency of turbo-compressors with water-cooling is defined as the ratio of the power required to compress the given quantity of gas isothermally to the power consumed at the compressor coupling in the actual compression. This efficiency in well designed units with discharge pressures between 60 and 150 pounds should fall within the limits of 60 and 70 per cent.

Turbo-Driven Pumps

The steam turbine is an ideal source of power to drive centrifugal pumps, especially when it is necessary to lift against high heads. Hence it has been installed in several places for city fire service, using lake or river water in high-pressure mains. The efficiency of such centrifugal pumps usually ranges from 65 to 80 per cent, so that, in spite of the high efficiency of the turbine itself, the combined set will not give as good economy as a high grade reciprocating pumping engine. However, its first cost is low, it requires no internal lubrication, takes up very little floor space, and has no valves to require examination or renewals.

Attempts have been made to adopt steam turbines for direct connection to continuous current generators and other slow-speed machinery. A steam turbine to be economical must be a high-speed machine, and hence its use with slow-speed machinery has not proved entirely satisfactory. Dr. De Laval adopted spur gearing as a means of reducing speeds on his first simple impulse turbines, and builders of this type still use this construction. It is only within the last few years that attempts have been made to apply gearing as a means of speed reduction on other types of turbines. The Westinghouse Machine Co. is now manufacturing direct-current turbo-generators with the Melville-MacAlpine reduction gearing between turbine and generator. This gear is also being built for use in marine work to drive slow-speed propellers. The gear wheels in this construction are carried on a floating frame so that the teeth may be always in correct alignment. One set of such gearing showed under test an efficiency of 98.5 per cent.

Geared Turbines

C. A. Parsons & Co. have built several notable reduction gears for steam turbines, in which the floating frame idea was omitted. A mixed pressure steam turbine is now in use driving a three high set of rolls through gearing at the Calderbank Steel Works near Glasgow, Scotland. A flywheel is placed on the same shaft as the driven gear and thus takes the shock off the turbine when a billet enters the rolls.

It is perfectly feasible to adopt the steam turbine through gearing to belt and rope drives when these are required in large powers. Under certain conditions, where fuel costs are high and water for condensation is plentiful, such an installation would prove an economical investment in place of reciprocating engines. The direct turbine drive would then come into competition with the motor drive. The losses in line shafting can be greatly reduced by the use of ball or roller bearings so that the turbine drive may prove very economical in some instances as compared with individual motor drives.

The use of geared turbines in large sizes has been in the nature of an experiment until quite recently. Judging from the results obtained in recent installations, their commercial success seems now assured.

The cost of manufacture is a very important item in determining the future development of the steam turbine. Types such as the original Parsons and the Rateau, while inherently of very high efficiency, have too high manufacturing costs to compete with the new combined types.

The writer offers as his opinion that the combined types, such as the Curtis-Parsons, the Curtis-Rateau and also the Curtis-Rateau-Parsons, prev-

iously described, will very soon supersede the simple types. It is probable that the Curtis turbine will eventually be built only in horizontal units and will gradually be modified to a Rateau or even a drum impulse construction in the low-pressure sections. The freedom from close adjustment in impulse turbines and the recent improvements in blading materials will greatly increase the use of this type, although Curtis-Parsons turbines are said to be cheaper to manufacture. In actual operation, it is an open question among engineers whether the reaction turbine has a higher commercial efficiency than the impulse type, and hence buyers usually consider first cost and personal preference only.

Turbines will probably be made shorter with very stiff shafts. With this construction many of the earlier blading troubles will disappear. But the peripheral speeds will also be increased and this will involve the development of suitable blading material and methods of holding blades that will satisfy these new requirements. Recent results seem to indicate that improved efficiency may be looked for with increased blade speeds.

Several impulse turbines have been built recently in Europe where the expansion was not complete in the nozzle, so that a portion of the expansion took place in the first moving blades. Some large Curtis turbines recently installed in America are said to have Parsons blading in the last stage. These developments would indicate a movement to introduce reaction principles in impulse turbines, and further illustrate the tendency to merge types.

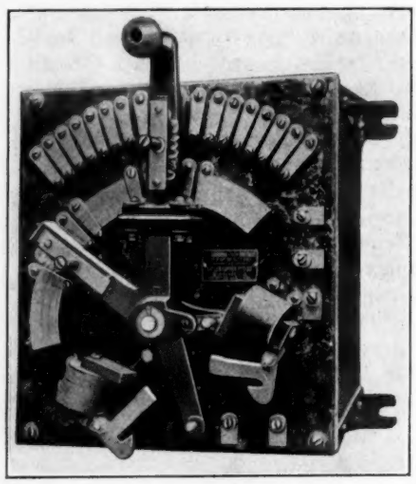
With regard to detail, simplicity will be the leading consideration. With the introduction of Curtis high-pressure stages, nozzle governing will undoubtedly be used to an increasing extent, though the results obtained by Westinghouse, by Zoelly, and by Bergmann with simple throttling governors, raise a question as to whether the additional complication of nozzle governing will pay. Oil relays will probably replace all other systems of governing on account of their simplicity and reliability. The simple and efficient centrifugal oil pump governor of Sulzer appears to be an improvement of considerable moment, and will probably receive extensive use.

With the development of suitable gearing for steam turbines, their field of application has been greatly increased and turbines will shortly be used for purposes which engineers today would consider them utterly unfit. Low-pressure turbines will continue to be installed in plants where reciprocating engines are still in operation and also where large quantities of waste heat are available. The low and mixed pressure types of turbines will find a very extended use in connection with heating systems, evaporators, etc.

The development of the past ten years has been truly marvelous. No great gain in thermal efficiency seems possible, so that future improvements will be largely along the line of detail construction and modification.

Reversing Duty Motor Starter

The increased use of individual motor-driven machines has also led to uses requiring a motor capable of being operated in either direction. The reversible starter for dirrect current motors illustrated herewith is a



CUTLER-HAMMER REVERSIBLE MOTOR STARTER

newly designed type built by The Cutler-Hammer Mfg. Co., Milwaukee. This starter provides in one apparatus means for proper acceleration of the motor in either direction. One operating lever only is required. When running in either direction, the motor is protected against failure of current supply or excessive drop in voltage, just as in the single direction starter. The lever is automatically returned to the central or "off" position if the current fails or voltage drops so that excessive currents and burn-outs of the motor cannot occur. Renewable segments are used on this type of starter.

A new plant is being designed for the Germantown Tool Works at Wayne Junction, Pa., to consist of seven one-story buildings.

A Comprehensive Catalog of Cutler-Hammer Products

The Cutler-Hammer Mfg. Co., Milwaukee, recently issued a catalog covering all of its products, which has a number of unique features. It is a loose leaf book containing over 800 pages, 5 x 8 inches in size. It is thoroughly indexed and is divided into 15 departments, each provided with ready reference index tabs. In this manner data regarding related apparatus is grouped together. For instance, the first department covers field rheostats, the second motor starters and the third speed regulators, etc. Each separate device is described in an individual bulletin, and as changes are made in the apparatus new bulletins are sent to the owners of the catalog from time to time. In this manner it is possible to keep the book up-to-date without trouble.

The volume contains such an unusual amount of information regarding electrical apparatus as to almost deserve the name of a handbook on controllers, rheostats, motor starters, regulators, etc. Each piece of apparatus is not only fully described and illustrated, but dimensions, prices and special information regarding its uses are given. There is a margin of 1⅛ inches on each page which is occupied by a series of thumb-nail sketches showing typical installations of the various types of apparatus. This information should be especially valuable to the designer in furnishing him with ideas on the best methods of laying-out electrical systems.

The book was edited and published under the direction of Charles L. Benjamin, advertising manager of the Cutler-Hammer Mfg. Co.

Auto cylinders, pistons and piston rings will be made by The Reliance Foundry Co., Richmond, Ind., recently incorporated. No heavy work will be undertaken for the present. The company advises that its output will be about 30,000 tons annually. The foundry has been equipped with up-to-date machinery.

California is the only state which makes a commercial production of borax annually. The output for 1910 according to the United States Geological Survey was 42,357 short tons, valued at $1,201,842. Less than 4 tons was imported. About one-half of the borax consumed is used in the enameling industry for making kitchen and sanitary ware. Each year some new use is found for the mineral.

Essential Features of a Foundry Cost System

Suggestion for Arranging a System to Meet Individual Requirements—Record Cards and Monthly Cost Compilations

By S. E. Nold

So many foundry cost systems have been offered from time to time, varying widely in method and detail, that it will savor of presumption to say that my method of collecting, arranging and disposing of foundry data is better than any other. As a matter of fact, nearly every foundry requires different treatment and a cost man must arrange a system to fit into the conditions as he finds them.

The cost man in a manufacturing plant is usually looked upon as the trouble man of the place. He must get the data and get it correctly, or all his work is a farce. Too often he fails, because he cannot get the support of the men higher up to compel those on whom he must depend for information, to supply, through avenues, he has prepared, the data he must have to get results. When the foundry manager, superintendent or foreman — whatever the title of the man in charge may be—heartily co-operates with the cost man, the result is never in doubt. And who, if not the foreman, ought to be so much interested in getting an intelligent exposition and comparison of facts about the foundry work? In addition to daily reports, the foreman should be furnished with a copy of the monthly reports, the same as furnished the management by the cost man. This will make him not only willing, but anxious to assist in having all the data shown up in the reports. This may look like dictation to the management, but it is really only a plea that the cost man be given a reasonable opportunity to make good.

No cost system can be satisfactory unless it takes care of every item of material and labor outlay and overhead charges, or if a part of a manufacturing plant, its proportionate share of overhead charges. All material and labor must be classified under a sufficient number of heads, in order that a higher or lower cost can readily be traced to particular items.

But systematizing can easily be overdone. Don't waste time on molehills when you have mountains to compute. Systems burdened with cumbrous and extended details, giving no useful information, nor contributing to means of discovering the causes that help to make an increase or decrease in the cost of the output from month to month, are like roads built and maintained at big expense, but leading to nowhere. All that can be said for them is that they are somebody's very elaborate and beautiful system.

After a cost system is installed, no matter how simple or elaborate, every detail must be religiously followed up and faithfully carried out, or failure will follow. *Everlastingly after it,* is the price of a clean cost. No system can work itself.

Carefully-prepared printed forms are indispensable in cost work. Universal forms are seldom satisfactory, as they are sure to lack either something essential, or call for information not wanted. A new cost man who sweeps aside all that his predecessor has left over, sending printed forms to the obsolete corner, is a bull in a china store. Some of the most complete and desirable forms I have seen, I found among the effects of a cost man who had failed to make good. Proof that complete forms cannot produce satisfactory cost.

I have been asked to give forms that have proven satisfactory, with information how to use them. While these answered their purpose admirably where they were used, most of them would undoubtedly have to be modified to fit into another.

All forms should be made in standard sizes. A card half an inch too long or too wide adds unnecessary expense, and breeds profanity, as it will fit into no filing case. A list of standard sizes can be had for the asking from any firm furnishing filing cabinets and card systems. Before sending a form to the printer, be sure to mark on the copy and insist on having printed on the job a line similar to this: L-483-500-2-25-12. This would read: L, the department to be charged; 483, the form number; 500, number of cards or sheets ordered, and 2-25-12, date of order. This will tell at a glance, when your stock gets low, how long this lot has lasted without the necessity of looking up the invoice and to what department to charge the job.

The material card shown in Fig. 1 was designed for pig iron, but later was used for all kinds of foundry material. Pig, scrap, fire clay, fire brick, limestone, coke, coal, sand, seacoal, coke blacking, flour, molasses and lumber were among the materials I kept track of on these cards. All invoices for foundry material were sent to my desk and from these I filled out duplicate cards for each invoice, retaining one, and sending the other to the foundry foreman. All pig iron was ranked, each car by itself, and the car number painted on several pigs of each car. The amounts taken from each car were reported daily to the foundry office, and entered on the material cards. When a car was used, it was reported to the foundry office, and the corresponding card was footed and compared with the invoice weight. In this way errors in weighing and reporting were detected, and made the men in charge more careful. Other materials recorded on these cards were reported, daily or monthly. But how, when and by whom and where and how the materials are kept depends so much on the situation and the men in charge that a plan must be worked out for each separate plant.

All metals and cupola supplies were daily reported to the cost man on daily cupola report blanks, shown in Fig. 8. This sheet was designed by the

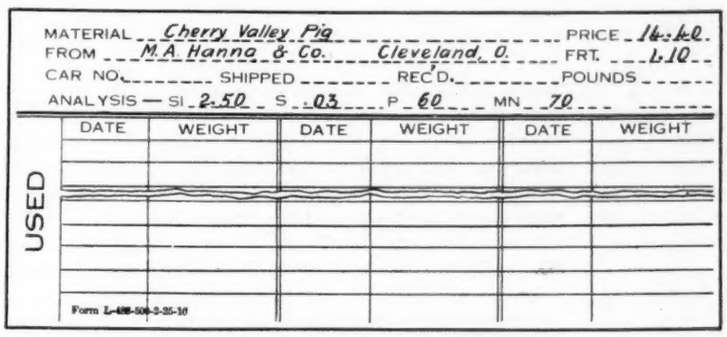


FIG. 1—MATERIAL CARD

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ORDER NO	DRAWING NO.	PATTERN NO.	PURCHASE ORDER NO.
NO. OF PIECES	DESCRIPTION		
DATE ORDER ISSUED	DATE PATT. IN F'D'Y	DATE CAST	DATE SHIPPED / WEIGHT LBS.

DATE	MOLDER	HANDY MAN	HELPER	DATE	CORES	HELPER	DATE	CHIPPER

MOLDER	HANDY MAN	HELPER	CORES	CHIPPER	O. K.
EST			EST		FOREMAN

FIG. 2—RECORD CARD

foundry superintendent to meet his particular requirements and provided for recording valuable data, for his own use. Only special work, calling for a certain analysis, was noted on the bottom of this report.

The record card, Fig. 2, and the work card, Fig. 3, brought the order into the foundry. The record card remained in the foundry office. The work card was broken in two and the molder's half was tacked onto the pattern and the coremaker's half was tacked onto the corebox, or was given to the core boss. The molders and coremakers entered their time on their respective cards. As the jobs were completed, these work cards were brought into the foundry office, and the time was transferred to the record card.

The chipping card, Fig. 4, was filled out in the foundry office from the record card, and was given to the chipping boss, and the time, if it was possible to distribute it fairly, was entered on these cards. Where there are many small pieces of many kinds, from many orders in the tumbling mills at the same time, an estimated cost placed on the record cards of each job in question, is the sensible thing to do. To spend 25 cents worth of time, trying to distribute 17 cents of cost, is *making cost*, not finding it. As fast as jobs are chipped, or if the pieces are large, as fast as pieces are chipped, they should be weighed and marked. *Mark every piece. Not* to mark them is one of the most prolific sources of error, trouble and loss. Mark them with yellow or white paint. Mark them somehow—but mark them. If there is insufficient space on a piece for a mark, wire a tag to one or more pieces of the lot, and mark the tag. I have seen so much trouble accruing from *not* doing it, that I am trying to emphasize the necessity of doing it. Mark your castings, and economize profanity, save friendships and make money for your firm. Somebody about your place ought to be able to tell how to mark them. Find the man!

In a jobbing foundry, immediate notice should be sent to the shipping department, or the department ordering shipments, of orders completed. In Fig. 6 is shown the daily foundry production sheet. Making up this report should be the first work of the foundry clerk in the morning. The order of the work would be something like this: Bring the molders' work cards and clock cards into the office. Check the work cards against the clock cards, and see that they agree. Enter all the work cards, containing time for the previous day, on the production sheet and note the number of pieces molded and molders' clock numbers. If a piece is partly molded, but none finished that day, mark *X* in *NF* (not finished) column, following the description.

As the weight and bad castings cannot be ascertained until the chipping and cleaning is done, a few of these partly finished sheets must be sent to those who need the information at once of what has been made. A number of sheets can be made at one writing by using carbon paper, and the number to be made and whom sent, must be determined by the management. These sheets should be on the desks where needed, an hour after work is begun in the morning. Those in charge of the work passing through the shops need this information as early as it is possible to get it to them. Two sheets must be retained in the foundry office until the weights and bad castings are filled in; then one copy is sent to the cost man and the other is retained.

A careful study of this sheet will show it to be a complete exposition of the progress of the work on the floor, the day's production and distribution, and the men producing each piece, and their failures. The time and material necessarily must be taken care of on other sheets or forms. On the daily foundry time sheet, Fig. 7, all foundry time is entered daily by the foundry clerk, after the production sheet is disposed of. All foundry clock cards should be classified by marking them as suggested by the numbers from 100 to 129 on the foundry time sheet. All cards

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ORDER NO.	PURCHASE ORDER NO.	ORDER NO.	PURCHASE ORDER NO.
DRAWING NO.	PATTERN NO.	DRAWING NO.	PATTERN NO.
NO. OF PIECES	DESCRIPTION	NO. OF SETS	DESCRIPTION

DATE	MOLDER'S NO.	MOLDER'S TIME	HELPER'S NO.	HELPER'S TIME	NO. MADE	DATE	MAN'S NO.	CORE TIME	HELPER TIME	NO. MADE
TOTAL						TOTAL				

FIG. 3—WORK CARD

marked 110 would indicate molders; 115, coremakers, and so on through the list. It is comparatively easy to fill out these foundry time sheets by this method. These sheets are daily sent to the cost man. Checking these against the payroll at the end of the month, verifies the time and gives him an intelligent plan of distributing the time.

The condemnation report is shown in Fig. 5. When a piece is found to be defective or wrong, whether the discovery is made in the foundry, machine shop, erecting room or store room, a condemnation report should at once be made out. This should clearly state the description of the piece, what the defect is or the reason for rejection, and if possible, who is responsible, and the hours of machine time before the error was discovered. This report carries with it an order for a replacement, unless instructions to the contrary are given. The foundry superintendent or foreman should *OK* all condemnations made in the foundry and the superintendent or manager, those made outside of the foundry. This is only a suggestion, but the propriety of it can be appreciated. These condemnation reports are used by the cost man in making up the bad castings account for the month. The same condemnation reports can be used for all errors on all kinds of material throughout the plant, where a machine shop and other departments are in connection with the foundry.

A complete foundry report is made up at the end of each month from the data collected, most of it daily, and the balance at the end of the month. How best to summarize the material used depends so much on where it is stored, how it is transported, what the facilities are for weighing, and who has charge of it, that it seems worse than foolish to attempt to give general instructions that would be of any value. *Use common sense methods,* but by all means get a report on everything used. Check your material cards carefully each month with the stock on hand, wherever it is possible to do so. See to it that every bin and every package or lot, wherever it is possible to do so, is plainly marked to indicate what it contains. Time and money will be saved by following this procedure.

Collect all metals as shown in Table I, and carry out the cost at the purchase price, plus the freight. The total pounds of metals will represent the cupola charge for the month. It will be noted that part of the metals in this report were melted in an air furnace, but the principle is the same as if all had been melted in cupolas, except that additional supplies for melting are introduced. It is best, however, to make separate reports, as the cost of producing air furnace iron is not the same as for cupola iron.

REPLACE YES / NO — CONDEMNATION REPORT

ORDER NO	DRAWING NO	PATTERN NO	PURCHASE ORD
NO PCS DESCRIPTION		MATERIAL	WEIGHT

TO REPLACE PIECE REJECTED

Because of
- Defective Casting
- Error in Drawing
- Error in Pattern
- Error in Machine Shop
- Broken in Handling

OR

TOTAL LOSS — Yes No

If not state briefly where it can be used

MACHINE TIME 191_____

HRS	OPR.	
		FOREMAN
		SUPT

FIG. 5—CONDEMNATION REPORT

Form L 410-1M-10-12-10

ORDER NO	DRAWING NO.	PATTERN NO.	PURCHASE ORDER
NO. PCS.	DESCRIPTION		MARK CASTINGS

CHIPPERS			CLEANERS						GOOD CSTGS.	
DATE	CLOCK	HRS	DATE	CLOCK	HRS	DATE	CLOCK	HRS	NO	WEIGHT
									BAD CASTNGS	
									NO.	WEIGHT

FIG. 4—CHIPPING CARD

Referring to the item, 249,700 pounds Our Scrap, it will be noted that it is entered at the same price as Bought Scrap, namely, $14.25. On the other hand, the amount of gates and surplus and bad castings, which have been returned, and for which we have taken credit at the same price, amounted to only 184,126 pounds. As it seems a common practice to make no charge for gates and surplus added to the charge, and take no credit for gates and surplus returned, I call attention to the above figures. What would that have done to the cost if I had followed that plan? Charge everything you use, and take credit for everything you get back, is a rule that will keep you straight.

The item of loss, as here found, will need explanation, as it marks a new departure in foundry cost. All foundrymen know how difficult it is to get even an approximately correct account of the gates and surplus from day to day. Especially is this true when part of the castings are very heavy. You will not ask to be shown that this is true, you know it to be a fact. Years of experience and testing out have shown that the item of loss, the amount that goes up the stack and what is not recovered will, in a well-managed iron foundry, run uniformly. It has been demonstrated also, that where good conditions prevail, a loss slightly less than 3 per cent of the cupola charge can be obtained, while in shops where careless methods are the rule, there is no limit to the loss. By no means accept 3 per cent as a standard mark for

191....

DAILY (IRON / BRASS / STEEL....) FOUNDRY PRODUCTION

PURCHASE ORDER NO	ORDER NO	DRAWING NO.	PATTERN NO.	PIECES MOLDED NO.	PIECES MOLDED DESCRIPTION	GOOD CASTINGS WEIGHT AND DISTRIBUTION NO.	MACHINES	FDY. R	SHP. R			BAD CASTINGS NO.	BAD CASTINGS WEIGHT	CLOCK NO.	

FOUNDRY CLERK

FIG. 6—DAILY FOUNDRY PRODUCTION SHEET

your foundry. Find out what it is and use your own figure. If you use a rate just a shade higher than it really is, there will be a small accumulation of scrap not accounted for, which can be adjusted easily at any time.

Now, here is the proposition, and the solution of it. Assuming that 3 per cent would cover the loss, you have your good castings weighed to you, you have your bad castings weighed to you, and you have 3 per cent of your cupola charge representing your loss. The sum of these three amounts, deducted from your cupola charge, *must* leave the amount of your gates and surplus, the amount that ought to be recovered. With all sincerity I can say that this method has won out to the complete satisfaction of everyone I have known to try it, and it saves the necessity of weighing gates and surplus, except to verify the estimate for loss.

The melting supplies consist principally of fuel, flux and fire clay, and being reported daily on the cupola daily reports, it is a simple matter to make up the monthly report. Melting labor is taken from the Report of Foundry Time, Fig. 7. Assemble the three items—metals, melting supplies and melting labor—under Cost of Melted Iron, Table 1. By dividing each item by the number of pounds of good castings gives the cost of each item in one pound of good castings. The total of these extensions gives the cost of melted iron in good castings.

General supplies have already been noted on the Material Card, Fig. 1. Under this head are charged all material not included in metals and melting supplies. While I have thrown all these items together, they may be divided into molding supplies, core supplies and miscellaneous supplies, or each item can be carried out against one pound of good castings. But this would necessitate carrying out the ex-

DAILY REPORT
OF
FOUNDRY TIME

HEAT No._____ Date_____191

HOURS		RATE		REMARKS
	Cupola 100			
	" Helpers 101			
	Air Furnace 105			
	" Helpers 106			
	Molding 110			
	" Helpers 111			
	Core Making 115			
	" Helpers 116			
	Chipping 120			
	Cleaning 121			
	Smithing 125			
	Crane Service 126			
	Clerks 127			
	Repairs and Renewals 128			
	General Labor 129			
	TOTAL HOURS			

HOURS		Per Ct.	
	DIRECT TIME		
	INDIRECT TIME		

FIG. 7—DAILY FOUNDRY TIME SHEET

THE MORGAN ENGINEERING CO.
CUPOLA DAILY REPORT

CUPOLA NO._____ HEAT NO._____ DATE_____

	SI.	S.	P.	MN.	G. C.	C. C.	T. C.
ANALYSIS OF MIXTURE							
ANALYSIS OF HEAT							

PER CT.	MIXTURE	CAR No	WEIGHT	SUPPLIES	LBS.
				CUPOLA COKE	
				LIMESTONE	
				CHARCOAL	
				FIRE CLAY	
				COKE BLACKING	
				.....SAND	
				BLAST PUT ON	
				DROP BOTTOM	
				CONDITION METAL	
				TRANSVERSE	
				DEFLECTION	
				TENSILE	
TOTAL CHARGE					
SURPLUS					

MATERIAL FOR	DRAWING NO.	PATTERN NO.	ORDER NO.	DESCRIPTION

FIG. 8—DAILY CUPOLA REPORT BLANK

tensions, instead of six places, to at least seven or eight places. Up to a certain point it pays to go into small details, but too much attention to unimportant details that bring no results, become a burden.

The distribution of foundry labor, which includes all labor except melting labor and salaries, is explained by the Daily Foundry Time Report, Fig. 7. The cost of each division of time, divided by the number pounds of good castings, gives the cost in one pound of good castings of all labor except melting labor. This affords an opportunity to check each item against the same item in former reports, and aids in determining the causes of a higher or lower labor cost.

Salaries should be distributed through the overhead. As the overhead is made up almost entirely in the accounting department, it could not be gone into in an explanation of a foundry report.

Having the cost of melted iron, general supplies, foundry labor and overhead, and having found the cost of one pound of good castings in each, their total will represent the average cost per pound of good castings.

Having obtained the average cost of castings, we will proceed to show how to find the true cost of each piece or job. In studying the items of a foundry cost those which fluctuate most, and which in the largest measure contribute to a higher or lower cost, are molding, coremaking and chipping, cleaning being included in chipping. The other items remain more nearly constant as applying to the different pieces or jobs. Accepting this to be true, we will consider the base for figuring the foundry cost. Table III. Referring to the account

Table I.

March, 1912.

BASE FOR FIGURING FOUNDRY COST.

Net cost of castings		$0.019930
DEDUCT		
Molding	$0.003497	
Coremaking	0.001531	
Chipping	0.000836	0.005864
		$0.014066

Add actual molding, coremaking and chipping cost.

BASE, INCLUDING OVERHEAD IN DEDUCTION.

Net cost of castings		$0.019936
DEDUCT		
Molding	$0.003497	
Coremaking	0.001531	
Chipping	0.000836	
Overhead	0.003025	0.008889
		$0.011041

Per cent overhead is of molding, coremaking and chipping..... 52

Add actual molding, coremaking and chipping cost, plus 52 per cent, to get the cost on any one piece or job.

Table II.

FOUNDRY REPORT.

GENERAL SUPPLIES

				Total cost.
13.66	tons	stock coke	$ 2.95	$ 40.30
54.89	tons	stock coke	2.75	150.95
60.52	tons	Foltz sand	1.40	84.73
49.52	tons	sharp sand	0.80	39.62
24.10	tons	Alliance sand	1.05	25.30
12.32	tons	Tuscora sand	1.40	17.25
5.03	tons	Silica sand	1.10	5.53
4.45	tons	sea coal facing	5.10	22.70
2.79	tons	ventless facing	10.20	28.46
3.11	tons	core composition	24.00	74.64
1.71	tons	coke blacking	12.15	20.78
0.10	tons	flour	29.22	2.92
580		pounds Bull Run talc per 100 pounds	0.85	4.93
550		pounds plumbago	0.04	22.00
60		gallons molasses	0.14	8.40
5100		fire brick	24.71	126.02
				$674.53

FOUNDRY LABOR.

	Gross cost.	Cost per pound.
Molding	$3,214.44	$0.003497
Helpers	256.05	0.000278
Coremaking	1,407.14	0.001531
Chipping	730.83	0.000795
Cleaning	37.95	0.000041
Smithing	48.07	0.000053
Repairs and renewals	121.21	0.000132
Crane service	337.47	0.000367
General labor	1,429.49	0.001555
	$7,582.65	$0.008249

PER CENT OF TOTAL CHARGE.

Pounds.		Per cent.
919,213	good castings	80.82
16,578	bad castings	1.46
167,548	gates and surplus	14.72
34,021	loss	3.00
1,137,360	Total charge	100.00

PER CENT OF CASTINGS.

		Per cent.
919,213	good castings	98.23
16,578	bad castings	1.77
935,791		100.00

Table III.

FOUNDRY REPORT.

Cupola and Air Furnace Metals.

Pounds.	Gross tons.		Per ton.	Total cost.
143,960	64.27	Cherry valley pig	$16.75	$1,076.52
59,400	26.51	Cherry valley pig	18.90	501.04
21,200	9.56	Cherry valley pig	15.65	148.05
19,680	8.78	Dover pig	16.50	144.87
280,080	125.04	Dover pig	15.50	1,938.12
21,800	9.73	Seneca pig	17.40	169.30
2,400	1.07	Seneca pig	15.90	17.01
191,840	85.64	Bought scrap	14.25	1,220.37
115,300	51.47	Bought scrap	14.00	720.58
249,700	111.47	Our scrap	14.25	1,588.45
32,000	14.29	Steel scrap	12.00	171.48
1,137,363		Total charge		$7,695.79
34,021	—3 per cent for loss.			
1,103,339	Amount melted iron.			
	Credit:—			
16,578	Bad castings.			
167,548	Gates and surplus.			
184,126	82.20 gross tons at $14.25			$1,256.85
	Net cost of metals			$6,438.94

Melting Supplies.

		Total cost
57.20 tons coal	$ 2.00	$ 74.40
28.20 tons coal	1.60	45.12
58.72 tons cupola coke	3.60	211.39
10.00 tons fire clay	1.90	19.00
8.86 tons limestone	1.35	11.96
1,008 feet rough boards	10.00	10.08
		$371.95

Cost of Melted Iron.

	Total cost.	Cost per pound.
Metals	$6,438.94	$0.007006
Melting supplies	371.95	0.000404
Melting labor	313.95	0.000342
	$7,124.84	$0.007752

Cost of Cupola and Air Furnace Iron.

	Total cost.	Cost per pound.
Melted iron	$7,124.84	$0.007752
General supplies	674.53	0.000733
Foundry labor	7,582.65	0.008249
Overhead	2,780.96	0.003025
	$18,162.98	$0.019759

919,213 pounds of good castings cost $0.019759 per pound.
Average weight of castings, 133 pounds.

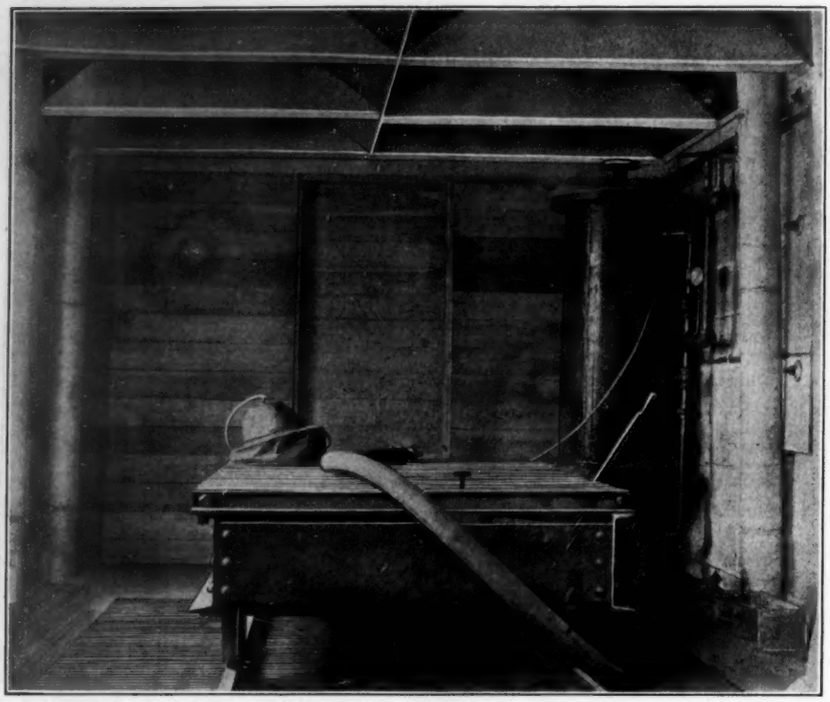


FIG. 1—INTERIOR OF THE SAND BLASTING ROOM

of foundry labor, Table II, deduct the total cost of molding, coremaking and chipping from the average cost of castings. This establishes a base for arriving at the individual piece or job cost. If the record card, Fig. 2, has been properly filled out, you will have the *actual* molding, coremaking and chipping time. Find the cost of this time and divide by the number of pounds in the piece or job and add this to base. This substitutes the actual cost of these items for the average cost, which was deduced.

A closer cost estimate can be obtained by including the overhead in the amount deducted from the average cost per pound. Find what per cent the overhead cost is of the molding, coremaking and chipping cost—in this case it is 52 per cent—and increase the total molding, coremaking and chipping cost on the record card by this percentage. Divide this amount by the number of pounds in the piece or job, and add this to the base, including the overhead in the deduction

A Model Sand - Blasting Room

The principal essentials to be provided for in designing a sand-blasting room are the rapid removal of dust and the proper recovery of the sand used in the operation. The Pawling & Harnischfeger Co., Milwaukee, has recently installed a sand-blasting room in its gray iron foundry which is very completely equipped and possesses a number of features of unusual interest. A general view of this room is shown in Fig. 1 and a plan is presented in Fig. 2. It is situated at one end of the shop, immediately adjacent to the finishing department and is so placed that the material entering and leaving it may be readily handled by the traveling crane. The room is about 12 feet long and 10 feet wide, with a head room of 6 feet. A sand blast machine, furnished by J. C. Busch, Milwaukee, is mounted in one corner, as indicated in the illustrations. One side of the room is provided with a large window giving plenty of light and doors are fitted at each end. An iron grating, as indicated in Fig. 1, comprises most of the floor. The used sand falls into a pit underneath this grating and may be easily removed by opening the trap doors in the platform built at one end of the room. Unusually complete arrangements have been made for the rapid removal of dust. The room is ceiled with galvanized steel sheets which are formed into eight exhaust hoods, as shown in Fig. 1. Each of these hoods is connected by a 4-inch exhaust pipe to the 50-inch, motor-driven fan placed outside. Three 4-inch exhaust pipes are also connected with each side of the pit under the grating. There are, therefore, 14 openings, eight in the ceiling and six in the floor, through which the dust is removed. The exhaust fan is driven by a 15-horsepower, Pawling & Harnischfeger, 220-volt motor running 650 revolutions per minute.

The castings are placed on a truck, *T*, Fig. 1, which runs on a track over the floor grating. This truck is strongly built of structural shapes and has sufficient capacity to handle the largest castings that can be brought into the sand blast room. The platform of the truck on which the castings rest is similar in construction to the grating in the floor of the room, thus permitting the sand to fall through to the pit beneath.

A company has been formed in conjunction with the Blaw Collapsible Steel Centering Co. in the Westinghouse building, Pittsburgh, composed of F. M. Bowman, Wayne Rawley and A. Bovard, who were formerly with the Riter-Conley Mfg. Co., as incorporators. The new company is looking for a site to locate a plant for the manufacture of steel centers used by the Blaw company, and also other steel specialties.

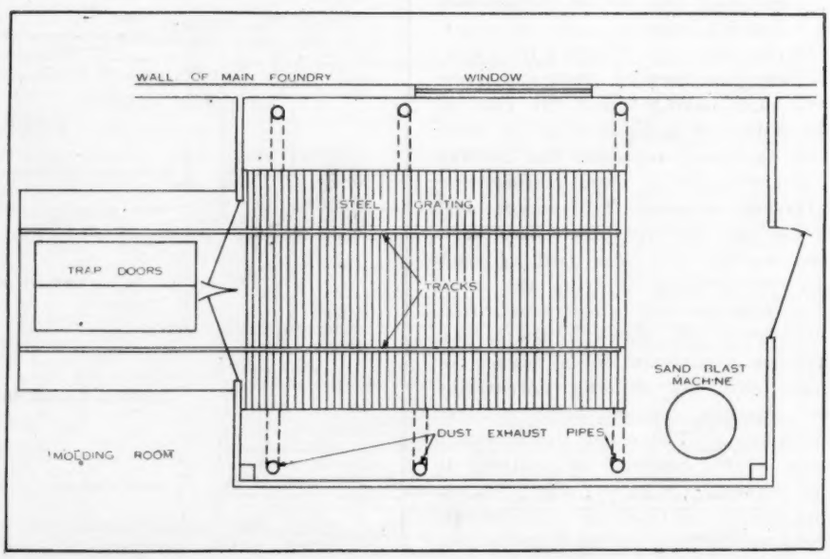


FIG. 2—PLAN VIEW OF THE SAND BLASTING ROOM

The Modern Boiler Shop and Its Equipment[1]

Construction and General Arrangement of the Buildings, Tools and Various Departments

By H C Meinholtz

The planning of a boiler shop involves careful study, principally on account of the variety of work that is, or may be, done in a shop fitted with modern appliances. We cannot calculate on building one particular class of boilers, smoke stacks, etc., but must consider also the general line of tank work, smoke flues, flumes and even structural work that must, of necessity, be done in connection with the regular line of boiler work. Usually a manufacturer has a particular line of work in hand and his principal object is to fit himself with a shop and tools to fabricate such specialties at a minimum cost.

Selecting the Site

The selection of a proper site for the erection of a shop is very important and as every boiler manufacturer is expected to attend to repair work besides the building of new work, the site that may be available, often determines the arrangement of building and machinery. In order to take advantage of sundry repair work, it is necessary to locate near the manufacturing centers of the large cities, while on the other hand, a strictly manufacturing plant may be located on the outskirts or in the suburbs of thickly-populated centers. Experience teaches us that the better and more intelligent class of mechanics favor living in or close to the large cities, principally because they are offered more opportunities to learn what work is accomplished by other men engaged in the same occupation, and they can also provide better and cheaper means for educating and entertaining their families. While it is true that in a community with an established manufacturing plant, there should be no scarcity of labor, yet we must admit that at certain times a boiler manufacturer is seriously handicapped by a scarcity of work to keep all his men employed advantageously and at such times a manufacturer located close to the labor market has a decided advantage.

A modern boiler shop should be of fireproof construction. All woodwork should be avoided as much as possible. The walls, columns, girders and roof should be built of non-combustible materials. A maximum of natural light and ventilation should be supplied to the workmen. The most serviceable shops have brick or concrete walls with a concrete roof supported on steel trusses. The roof should be reinforced with heavy steel wire and should be covered with the composition or prepared roofing. Ventilators in the roof should be provided also to carry off the smoke and fumes from the open fires. Hoods, such as are usually placed over the fires and heating forges do not provide ample means for carrying off the products of combustion. Window frames, three-sash high, are desirable, as two-thirds of the window opening is available for ventilation. All buildings should be built of ample height and at no point should the distance from the bottom of the roof trusses to the floor level be less than 20 feet.

Erecting Floor

When possible, the shop should have a main erecting floor of suitable width and length and the craneway should extend the entire length of the shop. The crane rails should be of sufficient height to permit of transferring work from one part of the shop to another without disturbing the work on the floor.

Lean-tos should be built on both sides of the erecting floor and the boiler shop machinery should be placed in these lean-tos to preserve a clear and unobstructed erecting floor. Lean-tos, 40 feet wide, are of ample size for the punches, shears, rolls, etc. While planning the location of the various machines, the loading and unloading facilities must be considered, since the tonnage of steel passing through a boiler shop is enormous. It is essential that the unloading of raw materials from cars be done at a different point than the loading of the finished product since in this manner a regular route of travel for the work through the shop can be established.

Proper racks should be provided so that immediately upon unloading plates from the cars, they can be properly assorted. Racks in which plates are placed in a vertical position are preferable, as less floor space is occupied than when the plates are stored flat. The layer-out should be stationed close to the plate racks and the splitting shears should be close at hand for cutting plates. All the punches should be placed in line and following these should be located the bevel shears for planers for beveling the edges of the sheets and next to these the rolls should be installed. At this stage of manufacture, the fitting-up is done, and space should be provided for machines to ream rivet holes and to prepare the plates for the riveter. In a 40-foot bay or lean-to, the splitting shears, bevel shears and planers may be set opposite the punches. The trusses supporting the roof over the lean-to should be of ample strength to support a runway for small, hand-operated cranes. In a 40-foot bay, parallel runways, 20 feet wide, should be provided, so arranged that one set of cranes will pass the other. The advantage of such an arrangement is apparent, as each machine may have its own crane, nevertheless the operator on any one machine may remove his work and transport it to another machine without interfering with his neighbor. These cranes also can be provided with interlocking devices so that a continuous crane, 40 feet long, can be made of the two shorter travelers. Owing to the fact that the sharp edges on plate are liable to injure the workmen, it is advisable to have a clear floor all around the machines. Riveters should be placed in the lean-to commanded by the cranes and they should be so located that the work from the riveter can be reached by the main crane serving the erecting floor.

Individual Motor Drive

All the punches, shears, rolls, etc., should be operated by individual motors of the same type and speed. By selecting a few sizes of one type of motor, and by carrying an extra motor of each size on hand, no serious delays can occur, since a spare motor can readily be used to replace a defective machine and no fitting of base plates or change of gearing is required. When no extra motors are at hand, often a motor from another machine not in use, may be utilized.

Flange shops should be separated from the main shop, wherever possible, but should be located so that the work may be passed from one shop to the other at a minimum of expense. In addition

[1]Presented at the New Orleans convention of the American Boiler Manufacturers' Association.

to the customary flanging machines, a large furnace should be provided so that all flanged work may be heated, straightened and properly annealed.

Power House

The power house should be isolated from the main and flange shops. In addition to the engine and air compressor, the hydraulic pump and accumulator should be placed in the engine room so that all power units may be directly in care of the engine room attendant. The hydraulic riveters, punches, flanging machines, etc., should be arranged in such a manner that the distance of travel of the water through the pipes supplying the various machines is reduced to a minimum. Proper shock absorbing valves should be provided as well as safety appliances to prevent over-pumping the accumulator; a special check valve should be placed in the supply pipe to the accumulator so that in case of a failure in the hydraulic pipe, the accumulator will not drop suddenly and injure the machine or buildings. The hydraulic pump should be fitted with a speed controlling device so that a fixed speed of the pump cannot be exceeded in case of a break in the pressure line. It has been the custom to equip shops containing machines that are of necessity operated at variable speeds, with direct current generator and motors, but for operating a boiler shop we can safely consider alternating current machines since the variations of speed that can be obtained with the alternating current motors are quite ample for all purposes.

A special section of the shop, preferably close to the loading or shipping track, should be set aside for a test floor and a system of drains should connect the floor with a reserve or storage cistern. A cistern of this kind will serve more than one purpose. In addition to saving the water used for testing, it also provides a means of storing a few days' supply of rain water that may be led to this cistern from all roof areas and in case of any mishap to the regular water supply, the necessary water for operating the steam plant may be drawn from a cistern of this kind.

While we are considering a strictly fireproof shop, we must, nevertheless, provide the necessary means to successfully fight a fire and an adequate number of non-freezable fire plugs should be installed with the necessary hose and nozzles. A separate building should be provided for the storage of oils, paints, etc., and only small quantities of oils and paints, such as are required for immediate use, should be permitted in the shop.

In the majority of shops no provision is made for heating in cold weather. It is a mistaken idea to expect workmen to keep themselves warm by work, as a great many men are employed at work that does not require a sufficient amount of energy to keep them warm, and means should be provided to maintain a shop temperature of about 50 degrees Fahr. in severe weather.

FIG. 1—METHOD OF USING THE PORTABLE PYROMETER

A New Portable Pyrometer

By J. A. Seager

The heat treatent of materials is now of such importance that it is necessary that a very accurate check be kept upon the actual temperatures within furnaces in which iron and steel articles are being operated upon by high temperatures. Both electrical and optical types of pyrometers are extensively used for this purpose. It will be found, however, that on surveying the instruments which are available for pyrometry, both the electrical and radiation types of pyrometers depend to some extent upon accessory instruments or apparatus. Where the instrument is designed to be absolutely portable and capable of quick and easy use it should, if possible, be so designed as to be a zero instrument, that is, it should contain within itself means for identifying without comparison with any other object the precise point of temperature at which it is desired to maintain the object in the furnace. A new portable pyrometer, entirely self-contained, is now being manufactured by W. & J. George, Ltd., Birmingham, Eng.

The external appearance of this pyrometer is shown in Fig. 1. It consists of a series of small glass cells with translucent ends containing dyes so chosen that their absorptive power will deal with all the light of whatever color emitted by the hot body to be observed and it is applicable for determining temperatures of heated bodies in processes which involve the use of kilns, retorts and furnaces of the crucible, open-hearth, case-hardening, annealing and other types.

Theory of Observation

To understand the action of this instrument it is necessary to consider the action of light upon the eye. If the luminosity of a colored object is very much reduced, a point is reached at which it appears to be no longer colored, but usually has a pale gray tint which does not fade entirely from sight. This is usually explained upon the theory that the rods of the retina, although giving an impression of light, are not sensitive to color values, these color values becoming evident as soon as the intensity of the light is sufficient to stimulate the cones of the retina. Moreover, it is found that the use of this pyrometer is to note the change from the grayish, phosphorescent glow to the dark red tint which is allowed to predominate in the dye mixtures, so that the eye can in this way detect very accurately the critical point in the change of intensity of luminosity of the body observed.

As the intensity of the light and the range of wave lengths of light emitted by a heated body is a function of its temperature, it appears that cells with dye solutions can be constructed which will each correspond to a definite temperature, and a great number of dyes have been examined and tested from specific

observation and combined in order to give the best results. Therefore, no accessory apparatus is required in connection with this pyrometer, its action simply depending upon the differenciation of the physical or optical action of the cones and rods in the retina of the eye.

Stereoscope in Form

To permit both eyes to be used at one time, the apparatus is made in a stereoscope form and under these conditions it is strictly a zero instrument, without any accessory apparatus, the temperature point required being that observed when the object itself disappears from view. The pyrometer is used at a distance from the hot body observed. So long as no smoke or other disturbing factor intervenes, the pyrometer can be used at any convenient distance from the object as illustrated in Fig. 2, where it is being used for observing a bath of metal. In this case the pyrometer is applied to the eyes and in a comparatively short time the bath of metal will be visible as a deep crimson patch of the same shape as the observation port if the temperature is higher than that engraved on the cell caps. In order to maintain one steady pressure it is simply necessary to use two pairs of cells, one for a temperature slightly higher than the other. The object observed will then be at its correct temperature when the observation port is visible through the lower temperature cell of the pair and invisible through the higher temperature cell. This enables the temperature of the furnace to be regulated within very fine limits of accuracy.

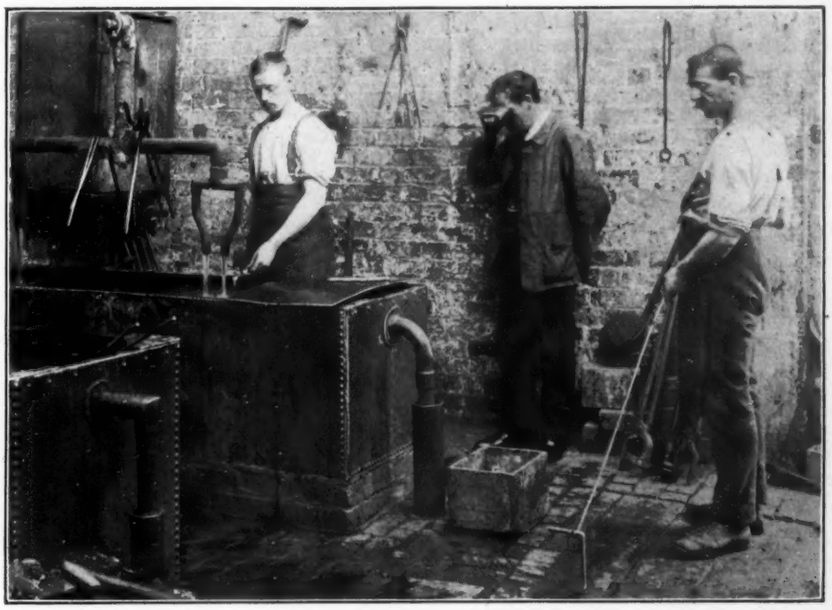


FIG. 3—USE OF THE PYROMETER IN HEAT-TREATING PROCESSES

Fig. 3 shows another interesting application of this pyrometer in heat treatment processes. The only drawback to the use of the instrument is in cases where dense fumes are present and when these are interposed, the readings become distinctly low. If thick layers of carbon monoxide, carbon dioxide or water vapor intervene between the object observed and the pyrometer, there is a slight lowering of the readings while it appears that the temperature of an object in the furnace appears to be slightly higher, as observed by the pyrometer, than the same object out of the furnace. Moreover, the pyrometer cannot be used unless the hot body is itself visible either to direct observation or by reflection. Within these limits, however, a distinct field of application is available which renders the instrument a valuable adjunct to heat treatment processes.

FIG. 2—PYROMETER USED FOR OBTAINING THE TEMPERATURE OF MOLTEN METAL IN A FURNACE

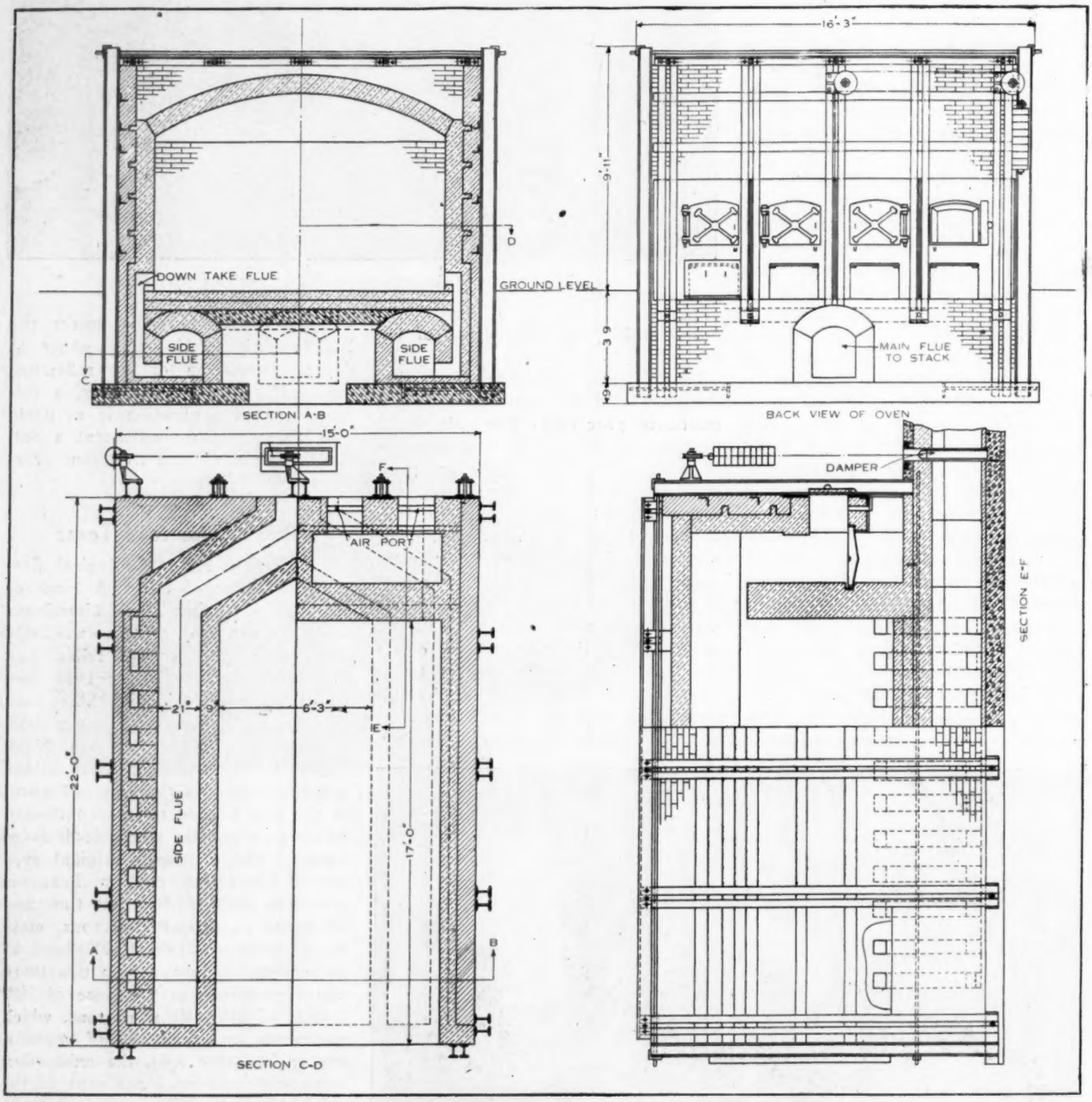
Coal Resources of Texas

The United States Geological Survey's estimates of the coal areas of Texas show that the bituminous fields known to contain workable coal cover 8,200 square miles, and that 5,300 square miles, not so well known, may contain workable coal. The known lignite areas cover 2,000 square miles, and there are 53,000 square miles, extending from Sabine and Red rivers on the east and north to the Rio Grande on the southwest, which may contain workable beds of lignite. The estimated original supply of bituminous coal in Texas is placed at 8,000,000,000 short tons and of lignite at 23,000,000,000 tons, making a total of 31,000,000,000 tons as the original supply. From this there had been mined to the close of 1910 a total of 20,056,941 short tons, which represents an exhaustion of approximately 30,000,000 tons, the exhaustion being one-tenth of 1 per cent of the original supply. The supply left in the ground at the close of 1910 would be equal to 19,000 times the production of that year.

Steam dissociated into the two gases, hydrogen and oxygen, is proposed as a substitute for superheated steam in purifying metals. The steam is generated in a boiler and passed through a heated retort.

A New Malleable Annealing Oven

The accompanying illustration shows the construction of an annealing oven with a new style of flue arrangement, which has recently been designed by the Whiting Foundry Equipment Co., Harvey, Ill. The older type of oven, from which this was developed, had their maximum height 22½ inches. The side flues communicate at the rear with the main chimney flue and receive the burned gases from the floor of the oven through a series of down-take flues placed in the wall. The grate, which has an area of 10 square feet, is at the rear, the flame and hot gases entering the annealing chamber over a bridge wall situated unusually efficient. An oven of this type was tested in service and six pyrometers placed at various points showed a variation of only 50 degrees Fahr. Since the temperature within the oven ranges from 1,250 degrees to about 2,000 degrees Fahr., the negligible effect of so slight a variation in temperature as that given above will be appreciated. The side flues under



SECTIONAL AND PLAN VIEWS OF MALLEABLE ANNEALING OVEN

a large number of take-off flues of small size under the floor, and in order to clean them it was generally necessary to remove the floor of the oven bodily. In the new design there are only two large side flues, 21 inches square, situated as shown in the accompanying illustration. These have fire brick arched roofs, which make immediately in front of the grate. The distance from the top of the wall to the top of the grates is 4 feet 1½ inches, while that from the top of the wall to the highest point in he arch of the furnace roof is 24 inches, the bridge wall itself being 18 inches thick. This flue arrangement is exceedingly simple and is said to be the floor are easily accessible and may be readily cleaned.

In addition to its flue arrangement this oven has several other improved features. The roof is a single transverse fire brick arch and in order to prevent the sides from bulging, due to the influences of heat, five brace walls are built across the roof. The bind-

ing is extra heavy, consisting of 6-inch I-beams placed in pairs completely around the walls. These beams are securely tied together at the top over the brace walls by heavy steel rods.

The fire doors are 17 x 18 inches in size and are made with slots to take up the expansion. The doors have 4½-inch fire brick linings and no metal is exposed to the heat. An air port with an adjustable slide is built in the door sill. This conveys fresh air from the ash pit to the top of the fire.

The oven shown in the accompanying illustrations is 22 feet in length over all, 15 feet wide and 13 feet 8 inches in height. From the ground level to the top of the oven the distance is 9 feet 11 inches. Inside the oven is 16½ feet in length, 12 feet in width and 8 feet in height to the center of the arch. It is completely lined with fire brick, the walls and roof having an average thickness of 9 inches. The side walls are further strengthened by a 9-inch course of common brick, mortised to the fire brick wall.

Coal Production of New Mexico

The production of coal in New Mexico in 1911 was 3,148,158 short tons, with a spot value of $4,525,925, according to a statement by E. W. Parker, just made public by the United States geological survey. In common with most of the states in the Rocky Mountain region, New Mexico produced less coal in 1911 than in 1910. Several causes contributed to the decreased production; the unusually mild weather in the winter of 1910-11, a drought in the Great Plains states which reduced the demands for coal for domestic use, decreased consumption by railroad loomotives, and the resumption of coal mining in the central and southwestern states after the six months' strike of 1910. The combined effect of these influences on the coal production of New Mexico was a decrease of 360,163 short tons, or 10.3 per cent. The value declined $351,226, or 7.2 per cent. All the counties of the state showed decreases in production except McKinley county, which increased 32,635 short tons. Colfax county, in addition to producing 75 per cent of the total output of New Mexico, is also the only county in which coking operations are carried on, and in 1911 a total of 767,108 tons of coal mined in that county was made into coke. In 1910 the coal made into coke in Colfax county amounted to 701,204 tons.

The number of men employed in the coal mines of New Mexico in 1911 was 4,007, who worked an average of 230 days, against 3,585 for an average of 283 days in 1910. The average production for each employe in 1911 was 785.7 tons for the year, or 3.41 tons a day, against 979 tons and 3.46 tons, respectively, in 1910.

Record Production of German Pig Iron

The month of March witnessed a record production of pig iron in Germany, according to the *Frankfurter Zeitung*. The production amounted to 1,424,076 metric tons, making a total of 4,116,652 metric tons for the first quarter of 1912, being an increase of 294,661 metric tons over the corresponding period of last year. The extraordinary development that has taken place in the German pig iron industry is illustrated by a comparison of the average daily output of pig iron for the first three months of the years 1912 and 1902. The output in the latter had a daily average of 21,504 metric tons, against an average of 45,238 tons for the current year.

Reviews of Catalogues and other Trade Publications

CONVEYING AND HANDLING MACHINERY.—Equipment for handling coal, earth, sand, clay, concrete, etc., is described in a circular issued by the C. W. Hunt Co., West New Brighton, N. Y.

ELECTRIC FANS. — The Westinghouse Electric & Mfg. Co., Pittsburgh, in two folders, recently issued, describes its 1912 line of fan motors. One of these folders is devoted to alternating current fans and the other to direct current fans. The new line of steel frame fans also is well illustrated and described.

VANADIUM STEEL.—A folder issued by the McKenna Bros. Brass Co., Pittsburgh, is devoted to vanadium high speed steel of the "Red Cut Superior" brand, manufactured by the Vanadium-Alloys Steel Co., and sold by the former concern. The McKenna Bros. Co. has recently reduced the price of high speed drills and bridge reamers.

PUMPS.—Pumps of various types, manufactured by the American Well Works, Aurora, Ill., are described and illustrated in a circular distributed by that concern. Various factors which enter into the economical operation of pumps, choosing a pump to meet special requirements, and other questions are touched upon in this circular.

VALVES.—The Homestead Valve Mfg. Co., Pittsburgh, has issued a catalog containing complete price lists and descriptions of its line of valves and other specialties. The company announces that it has installed new and modern machinery and adopted new methods which enable it to manufacture valves in greater quantities than heretofore. The catalog is handsomely illustrated.

AERONAUTICAL MOTORS.—A catalog issued by the B. F. Sturtevant Co., Hyde Park, Mass., describes a new motor manufactured by that concern for aeronautical purposes. It is of the four-cycle, gasoline-driven type, with four and six cylinders arranged vertically. It is designed to permit of continuous operation for periods of 12 hours or more, without attention as to oiling or adjustment. It will also operate for extended periods at an angle.

HYDRAULIC BENDERS.—A catalog under the foregoing title has been issued by the Watson-Stillman Co., 50 Church street, New York. It is an assortment of sheets selected from over 1,000 pages of printed matter issued by that concern at various times. The benders described are for use in bending all kinds of rails, structural shapes, reinforcing rods and pipe; for shaping automobile frames; for straightening rods or shafts while held between lathe centers, etc.

OFFICE FILING CABINETS.—A catalog just issued by the Canton Mfg. Co., Canton, O., is devoted to a line of office filing cabinets manufactured by that concern. These cabinets may be furnished in full quartered white oak or in light golden oak. The drawers are provided with metal partitions which are so spaced as to insure the true vertical filing of all documents. This catalog, which is the first issued by the Canton company on this line of products, contains numerous illustrations and much information concerning the correct method of filing papers.

SEMI-STEEL.—David McLain, director of the Milwaukee Correspondence Schools, Milwaukee, has published a handsomely-illustrated, 32-page catalog, devoted to the manufacture of semi-steel by McLain's system. A large number of testimonial letters are included from practical foundrymen who have taken McLain's course and they speak in enthusiastic terms of the benefits derived therefrom. Nor is the work devoted entirely to testimonial letters, but in addition, views of a large number of semi-steel castings are included, made by students who previously had no knowledge of semi-steel practice.

SMOKELESS CHIMNEYS. — A 12-page pamphlet, under the foregoing title, issued by the Furnace Gas Consumer Co., Matteawan, N. Y., describes a device designed to insure complete combustion of fuel under boilers, without the formation of smoke or soot. It consists of a bank of fire clay tubes installed in the space back of the bridge wall, underneath the boiler. These tubes become white hot or incandescent and serve to reheat the distilled gases and air so that when the two mingle in the space back of the tubes, complete combustion takes place before the gases again strike the cold surface of the boiler.

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The Dissolution Policy

The report of the International Harvester Co. for 1911 is of unusual interest on account of its discussion of the attitude of the government toward the company and also on account of the features relating to improving the conditions of employes and of the education of farmers.

President McCormick tells how, more than six years ago, the company asked for its investigation by the United States government and opened all its books and records for inspection, furnishing all information requested. No suggestion, he says, of any change in the business method has been made by the government at any time. He tells of the recent full and frank discussion of the whole situation by representatives of the government and the company, in an honest desire on both sides to avoid litigation, and he says that some plan may yet be found that will obviate the necessity of any protracted litigation by satisfying the government without seriously impairing the economic advantages resulting from the reorganization of the company under the present plan. Mr. McCormick adds, however, that no form of reorganization has been suggested by the government which seems practically possible. We do not believe that any plan will be suggested. The administration is thoroughly committed to the dissolution policy and is determined to pursue it regardless of the results. This is shown in the suit against the Steel Corporation, and particularly in the extended inquiry into the wire pools which was made last week. If the present suit afforded any reason for believing that it would result in some sort of sane supervision of great corporations, the government might be justified in the great expenditure of energy and money on its part and that of the Steel Corporation. So far as we are able to see, however, nothing but more farcical dissolution, or a complete triumph for the Steel Corporation, will come as a direct result from the pending suit.

The same will, in all likelihood, be true of the International Harvester Co. It may be, as President McCormick says, that the company's policy in its treatment of its customers, its employes, its agents and its competitors has been in accord with the highest standard of ethics and honorable business methods. That fact does not save it from assault from the government. The only hope seems to be that as these prosecutions drag along, the people of the country will become more and more thoroughly convinced of the futility of attempted dissolutions and will force their servants, the public officials, to adopt a different policy.

Steel Production at Record Rate

Our blast furnace returns for April, printed last week, showed that the non-merchant furnaces were producing pig iron in April at a greater rate than ever before in the history of the industry. As the steel works were not accumulating stocks of pig iron, and as they were using approximately as much merchant pig iron as at any former time, the conclusion is that in April a new rate for steel production was made in the United States.

The total production of pig iron, by merchant and non-merchant furnaces, did not make a new record in April, for the reason that the merchant furnace production was much smaller than at some former times.

The April production of coke and anthracite pig iron was 2,411,529 tons, for a 30-day month, which is equal, with an allowance of 250,000 tons for charcoal iron, to an annual rate of 29,600,000 tons of all grades of pig iron. This is not a new record. The heaviest production of pig iron, as a whole, was in the winter of 1909-10, when a rate of close to 32,000,000 tons was reached for a short time, while the total make from Oct. 1, 1909, to April 1, 1910, was about 15,500,000 tons, including charcoal iron, or at the rate of 31,000,000 tons a year. Possibly this fact is not generally appreciated, because the heavy make fell partly in one calendar year and partly in another, the result being that the best calendar year's record, in 1910, was only 27,303,567 tons. The six-month period was an important one, and we show its production in the table below, of coke and anthracite iron, by the merchant furnaces and the steel works furnaces:

MONTHLY PIG IRON PRODUCTION.

	Merchant.	Non-Merchant.	Total.
October, 1909	825,163	1,741,919	2,589,681
November, 1909	844,060	1,661,808	2,532,056
December, 1909	904,355	1,761,509	2,682,702
January, 1910	812,464	1,761,346	2,597,181
February, 1910	796,987	1,603,458	2,428,937
March, 1910	879,974	1,682,532	2,588,736

December, 1909, showed the heaviest production in the period by merchant furnaces, and January, 1910, the heaviest production by non-merchant furnaces. The February rate of production by the merchant furnaces was, however, the highest. It will be well to average the six months. The average daily rate of production from Oct. 1, 1909, to April 1, 1910, was as follows: Merchant, 27,800; non-merchant, 56,000; total, 83,800.

The average daily rate of production last month was as follows: Merchant, 17,600; non-merchant, 61,100; total, 78,700.

Thus the total pig iron production last month fell 6 per cent below the rate in the six-month period under comparison, while the merchant furnace production alone showed a decrease of 37 per cent and the steel works furnace production alone showed an increase of almost 5 per cent.

It remains to be considered how far the steel works consumption of merchant iron has varied. It is readily recalled that in the second half of 1909 the

large steel works were heavy purchasers of merchant iron, to supplement their own pig iron output. In a period of a few months, purchases of more than half a million tons of Bessemer iron alone were made by six interests, for various deliveries. Lately, however, some of these steel works have been purchasing merchant iron. The smaller independent steel works, which always use merchant iron, are probably using almost as much now as they were in 1909-10. Making a liberal allowance, it is practically certain that the steel works were not, in 1909-10, using as much as 5,000 tons per day more merchant iron than they were using last month, while the increase in the steel works' make of pig iron is seen to be 5,100 tons. Hence they are using more pig iron, whether made in their own furnaces or purchased, than they were in the former period. They are making more steel per ton of pig iron than formerly, for continuously the basic open-hearth process is supplanting the Bessemer, and the basic open-hearth process uses scrap, and therefore makes more steel than it consumes pig iron. With the same amount of pig iron, the steel works will today make more steel than would have been the case a few years ago.

The decrease in merchant furnace production is astonishing. It would not be supposed that when the steel works were making more pig iron than ever before, the merchant furnaces would be making less than two-thirds (63 per cent) as much pig iron as they were when the steel works made their previous production record. There has, of course, been a slight shifting of production by steel works making pig iron themselves when formerly they purchased merchant iron, but this can go but a short way towards accounting for the difference. One of three things must be the case: (1) Consumption of merchant pig iron by foundries has greatly decreased; (2) Consumption of steel is less than production; (3) Consumption of merchant pig iron by foundries is in excess of the current make. The first two alternatives may be dismissed. Consumption of the products of the foundry and consumption of the products of the steel works usually run hand in hand. Over long periods there are variations, but there can be no such great change, over a short period, as would be required to harmonize the figures. Consumption of steel, on the other hand, is certainly approximately equal to production. There is no hint of any large stocking process going on. This leaves the third proposition, that the merchant make of pig iron is not equal to the consumption. This is a plausible theory. It is well known that for a long while there has been consumption of the very heavy stocks which were accumulated in 1910, and this has served to make the merchant production less than the consumption. These stocks, however, are practically eliminated and perhaps suddenly the merchant make will have to be increased. Doubtless it would have increased before this, had it not been that high prices were required for coke, and current pig iron prices did not justify paying the advance upon coke. The pig iron market will simply have to take care of this, by moving to such a level as will justify the furnaces operating. If the iron is needed, it will have to be made, and paid for at a justifiable price.

Correcting Corrugated Roofing Abuses

A valued correspondent, whose letter is printed elsewhere, comments upon our editorial printed April 25, with the above caption, and expresses himself as "skeptical as to how far the good effects will reach" of selling sheet mill roofing products by weight instead of by area. There is no occasion for skepticism, since no absolute claim is made as to how far the reform will go in the matter of establishing honest practice in this much abused trade. The only claim made is that the new practice will help. For instance, we think we are right in concluding that if adopted by all producers, it will prevent the sale of material, which is half a gage light, for we infer that the material actually made would vary only by full gages, no half gages being made.

Our correspondent intimates that sheet mills may continue to sell 29-gage, rolled light, to roofing manufacturers. If the roofing manufacturers buy this material, they will have to sell the product by area, and if they do this, when the mills sell the same material by weight, surely buyers will wonder why the difference, and conclude there is something wrong with the material which is sold by area. In time, the abuse would be corrected, by the light of publicity being thrown upon it.

Our correspondent says further: "If the mills were to restore the old differential 15 cents for 11½ ounces, it might have a tendency to bring about the desired result, although, of course, there would be nothing compulsory in such a proceeding." His own words bring out the precise point we desire to make, that in various remedies, which might be proposed, there would be "nothing compulsory". Purchase by weight can be made compulsory, by producers refusing to sell any other way. The thing is absolute; there is no possibility of evasion or distortion; either it is so sold, or it is not. The change represents a positive step in the right direction. Of course, it does not accomplish everything. It will not convince consumers that 28-gage, or 26-gage, or 24-gage, is cheaper in the long run than 29-gage, but it will help to make them think.

Wasting Labor on Flimsy Steel

Editor THE IRON TRADE REVIEW:

Noting your editorial in the last issue relative to the matter of selling roofing by weight, we are rather skeptical as to how far the good effects will reach. What is to prevent the roofing dealer or even the jobber from buying 29 gage by weight and selling it by the square as standard roofing just the same as has heretofore been done?

Understand, we are heartily in sympathy with any movement which will bring about a more desirable and reasonable condition but as long as all of the mills sell this No. 29 gage (rolled light) to the roofing manufacturers, is it not reasonable to believe that they will continue to make the extreme light weight galvanized roofing? This whole question sums down to the matter of these two gages, No. 28 and No. 29. We have never had any complaint in reference to the heavier gages and in fact there is no incentive to manipulate it now in the heavier gages. Some time ago, a differential for 11½ ounce or No. 29 gage galvanized sheets to the roofing trade was wiped out and they were and are being sold at no advance whatever over base (No. 28).

Does this not encourage the roofing manufacturer to buy such stuff, send it out to the dealer and the latter even though he may pay for weight will more than likely sell by the square? When the ultimate consumer desires to buy sufficient corrugated or other forms of roofing to cover a barn or a building, he will do as he has heretofore done, measure up the surface and order from the dealer enough to cover that surface. In other words, he will buy by the square and he will very likely get the same old light weight, trashy material which we have been talking against for a long time. It is a crime to throw away high priced labor on this flimsy, light steel. No. 28 full weight should be the absolute limit and No. 26 is even better and not a great deal more expensive.

If the mills were to restore the old differential 15 cents for 11½ ounces it might have a tendency to bring about the desired result, although, of course, there would be nothing compulsory in such a proceeding. Since you have started a discussion on this subject, we would like to have your views on this matter.

Our position has been well known for years. We sell to the jobbing and manufacturing trade only and either by area or weight as they prefer. The test as to the success of this move does not lie with the mill but with the dealer who sells the material to the ultimate consumer.

An extended educational campaign may do considerable toward ameliorating the conditions. THE STARK ROLLING MILL CO.,
A. T. Enlow, Sales Manager.

Canton, O., April 30, 1912.

MEN OF THE IRON TRADE

Paul Oeking, Dusseldorf, Germany, manufacturer of shears and punches, is in this country on a business trip.

Gerge E. Coxe, mechanical, mining and metallurgical engineer, has been examining properties near Winnemucca, Nev.

Ralph D. Mershon, consulting mechanical and electrical engineer, has moved his New York office to 80 Madison Lane.

Frank N. Hoffstott, president of the Pressed Steel Car Co., New York, returned May 8 from an extended trip abroad.

W. R. Warner, of the Warner-Swasey Co., Cleveland, sailed for Europe May 8. He expects to be abroad several months.

H. C. Perle, advertising manager of the R. K. LeBlond Machine Tool Co., Cincinnati, is in Europe in the interests of his company.

S. L. Reynolds, Grand Rapids, Mich., has succeeded James Kent as resident manager of the Fort Wayne Electric Co., Pittsburgh.

L. F. Hamilton, publicity manager of the National Tube Co., Pittsburgh, is recovering at Atlantic City, N. J., from a long siege of typhoid fever.

Olin H. Landreth, professor of engineering at Union College, Schenectady, N. Y., has opened an office at 156 Fifth avenue, New York, as consulting engineer.

T. S. Catmur, manager for C. W. Burton, Griffiths & Co., engineers, London, sailed from Boston for England, May 14, after a five weeks' visit in this country.

J. J. Moore is now associated with the sales department of the Swind Machinery Co., Philadelphia. He was formerly engineer for the A. P. Witteman Co., of the same city.

Henry E. Riggs, of the Riggs & Sherman Co., consulting engineers, Toledo, O., has been appointed head of the department of civil engineering at the University of Michigan.

Mayor Thomas H. Burress, of Jonesboro, Ark., has been elected president of the Jonesboro Machine Co. W. S. Stroud has been chosen secretary and treasurer and W. E. Dodge manager. The company has placed its capital stock at $18,000.

George C. Jones, general manager of the Central Vermont railway, has been appointed vice president in charge of construction and operation of the Southern New England railway.

H. McL. Harding, consulting engineer for the design of terminal installations and freight handling machinery, is now located in the Whitehall building, 17 Battery place, New York.

Dr. Erich A. Beck, metallurgist with the Goldschmidt-Thermit Co., New York, spent two weeks recently on business for his company in Colorado. He plans to visit Germany this summer.

W. G. Swart, western representative of the American Zinc Ore Separating Co., with headquarters at Denver, is in Europe on professional business. He will be abroad about three months.

L. D. Huntoon, A. H. Elliott and B. Stoughton have associated themselves for the general practice of mining, metallurgical and chemical engineering, with offices at 165 Broadway, New York.

H. C. Estep, former division engineer of construction with the Chicago, Milwaukee & Puget Sound railway, has been appointed engineer of construction of the Southern New England railway.

W. P. Brown has resigned as contracting engineer of the King Bridge Co., Cleveland, to become associated with Wilbur J. Watson & Co., civil and architectural engineers, Citizens building, of the same city.

A. Travers-Ewell, formerly chief engineer of the Aporma Goldfields, Ltd., Tirapata, Peru, has returned to the United States. He will open an office for the general practice of engineering at Globe, Ariz.

Warren B. Flanders has left the steam turbine department of the Westinghouse Machine Co., East Pittsburgh, to accept a position with the Havana Electric Co., Havana, Cuba. The transfer was made May 1.

W. A. McGonagle, representing the United States Steel Corporation, last week told members of the new Duluth Commercial Club that the steel plant at Spirit Lake will be in operation in the near future. The plant, Mr. McGonagle said, will be one of the greatest in the west.

I. S. Keeler, assistant secretary, was elected to the directorate of the General Electric Co. at the annual meeting held in Schenectady, N. Y., succeeding T. Jefferson Coolidge. Other retiring directors were re-elected.

George Langen, general superintendent of the Cincinnati Planer Co., Oakley, Cincinnati, is recovering from an attack of appendicitis. He hopes to be able to make a business trip to Europe before the end of June.

W. C. Frye, treasurer of The Chain Belt Co., Milwaukee, Wis., has returned from a two months' trip through Europe. Mr. Frye combined business with pleasure and did some investigating work with reference to the export field of his company.

W. J. Norris, who recently resigned from the Wheeling Corrugating Co., has been appointed sales agent for the Parkersburg Iron & Steel Co., with headquarters in Parkersburg, W. Va., and will assume his new duties at once.

Horace W. King, identified with the Arnold Co., Chicago, who has had charge of hydro-electric and irrigation developments in various parts of the country, has been appointed professor of hydraulics and irrigation at the University of Michigan.

E. J. Hayman is in charge of the St. Louis branch office of the Parkersburg Iron & Steel Co., Parkersburg, W. Va., manufacturer of iron and steel black and galvanized sheets. The branch office, opened recently, is located in the Third National Bank building.

James A. Farrell, president of the United States Steel Corporation, left last week on an inspection trip through the Pittsburgh and Newcastle plants of the Corporation. He also will visit the Vandergrift plant, expecting to return to New York sometime this week.

F. E. Porter, president of the New York State Steel Co., visited his company's properties on the Mesabi range a couple of weeks ago. Prospects for a heavy ore movement this year are especially good, he said. Mines owned

MEN OF THE IRON TRADE

by Mr. Porter's company will ship about 345,000 tons of ore.

H. McL. Harding, consulting engineer for the design of terminal installations and freight handling machinery, recently moved his office to the Whitehall building, 17 Battery place, New York.

Clayton D. Walworth, until recently connected with the U. S. Wind Engine & Pump Co., Batavia, Ill., and Fairbanks, Morse & Co., is now in charge of the Chicago office of the Queen & Crescent Co.

C. T. Wilson, formerly city engineer of Waterloo, Ia., has purchased a half interest in the Dearborn Construction Co., and will act as resident manager. W. N. Dearborn is the other member of the company, which will have offices in the Waterloo Savings Bank building.

Edward E. Wright was recently appointed manager of the central sales district of the McKeen Motor Car Co., with offices in the Marquette building, Chicago. This is a new office, opened to take care of the increasing business of the McKeen company in the Chicago district.

Wiley L. Byers has resigned his position as manager of the Uniontown (Pa.) office of the J. K. Dimmick & Co., dealers in coal, coke and pig iron. C. C. Canoe, formerly assistant manager in Uniontown, but more recently connected with the Cleveland office of the company, was named as successor. Mr. Byers was in charge of the Uniontown office two and a half years. His resignation took effect May 15.

Prof. J. C. Pinney, instructor in the college of engineering of Marquette University, Milwaukee, Wis., has been appointed superintendent of public buildings and bridge construction of the city of Milwaukee, under F. G. Simmons, the new commissioner of public works. Mr. Pinney is a graduate of the college of engineering, University of Wisconsin, and has had five years' experience in practical work. He is 32 years old.

Charles F. Palmer has been made sales manager of the reorganized sales department of the J. Faessler Mfg. Co., Moberly, Mo., maker of boss and universal flue expanders, flue cutters and other boiler tools. Mr. Palmer will have offices at 810 Olive street, St. Louis. He is well qualified for the position through previous experience in selling Faessler tools and as a representative of the Frank H. Palmer Supply Co., St. Louis.

E. A. Probst was recently appointed division engineer in charge of construction of the line of the Southern New England Railroad Corporation, from Palmer, Mass., to Blackstone, with offices at Southbridge, Mass. T. I. Ellis has been appointed division engineer of the Southern New England railway in charge of construction of the line from Woonsocket, R. I., to Provdence, with offices at the latter city. Both companies are subsidiaries of the Grand Trunk railway.

Clarence C. Bailey, formerly with the signal department of the Illinois Central railway, with offices in Chicago, is now identified with the signal accessory department of the General Electric Co., Schenectady, N. Y. He will be associated with Harold Ferguson in adapting the General Electric Co.'s apparatus to the needs of railway signal departments. Mr. Bailey attended high school at Newton, Kan., and was graduated from Armour Institute, Chicago, a couple of years ago.

Capt. Joseph Park Hodgson, superintendent of the Breitung estate mines on the Marquette range, has tendered his resignation, to take effect May 31. He will leave the first of June for Bisbee, Ariz., to become superintendent of the Copper Queen Consolidated Co. His successor has not been named. Capt. Hodgson's mining career covers a period of 23 years in Marquette county. Upon going with the Breitung estate companies, he was made assistant superintendent, and became superintendent two years later.

B. S. Stephenson, who for the past two years has been connected with the Detroit office of M. A. Hanna & Co., Cleveland, has been appointed resident agent at Pittsburgh for the firm, having charge of sales of pig iron and fix ores in that district. Before going to Detroit, Mr. Stephenson was the New York representative of THE IRON TRADE REVIEW. The Hanna office in Pittsburgh will remain in the Oliver building. Mr. Stephenson succeeds Eliot A. Kebler, who has been elected sales manager of the Massillon Iron & Steel Co.

Charles M. Schwab, president, and other officials of the Bethlehem Steel Corporation were the hosts, May 9, for about 150 representatives of the New York banking and brokerage houses on a trip of inspection of the company's plant at South Bethlehem. The visitors largely represented New York bankers who are interested in a $50,000,000 issue of 5 per cent refunding bonds about to be issued by the company. The trip from New York to South Bethlehem was made by special train. The party inspected all departments of the Bethlehem works and afterwards were the guests of Mr. Schwab at luncheon at the plant.

Samuel M. Curwen has been elected president of the J. G. Brill Co., to fill the vacancy caused by the death of the late James Rawle. Edward Brill, surviving son of John George Brill, one of the founders of the company, was elected to succeed Mr. Curwen as vice president. The new head of the large car manufacturing plant entered the employ of the company as an apprentice in 1879. After completing his course in the shops, he was detailed as draftsman and soon rose to the head of the drafting department. In 1891 he became general salesman and was later made assistant general manager. When George Martin Brill gave up his duties as general manager, in 1903, Mr. Curwen was selected to fill that office. Following the death of John A. Brill, he was promoted to first vice president. Mr. Curwen is also president of the American Car Co., St. Louis; the G. C. Kuhlman Car Co., Cleveland; the Wason Mfg. Co., Springfield, Mass.—all subsidiary plants of the Brill company. Edward Brill, the new vice president, has been identified with the company for 32 years. He started as a time-keeper and worked up through the various departments. In 1888, he became head of the lumber department and continued in that position until 1906, when he was elected treasurer. Mr. Brill is treasurer and a director of the John Stephenson Co., and the American Car & Foundry Co. He is assistant treasurer and a director of the Wason Mfg. Co., and a director of the G. C. Kuhlman Car Co.

Baackes Tells How Judge Gary Killed a Pool

Only Three Per Cent of Product of American Steel and Wire Co. Sold by Plan Determined Illegal—Corporation Suit Hearing at New York

During the first week of the hearings in the Steel Corporation dissolution suit, the government's chief efforts have been devoted to a thorough inquiry into the organization and operation of the various wire pools, with a view toward determining the part which the American Steel & Wire Co. took in these associations, both before and after the formation of the United States Steel Corporation. This line of inquiry has brought to light considerable interesting information concerning the manner in which wire manufacturers sold under the rules of the association by allotment and at fixed prices prior to the year 1909, when the last of the pools was formally disbanded. That the American Steel & Wire Co. was a member of a number of these pools had previously been admitted in connection with the indictments returned against officials of the company by the United States grand jury at New York last summer, but the fact that only 3 per cent of its entire output was disposed of under allotment and the further fact that Judge Gary was the direct cause of the withdrawal of the American company from these associations, were unusually interesting points brought out in the week's testimony.

Complete details of the destruction of the various pool records and minutes at the North Works of the American Steel & Wire Co. at Worcester, Mass., in the fall of 1911, were also developed at the week's hearings. Frank Baackes, vice president of the company, during his examination on Thursday, assumed full responsibility in this matter, stating that he had given the orders for the destruction of the records. Mr. Baackes further stated that this was the second time that he had given such orders, as he had ordered all records to be destroyed immediately after the withdrawal of his company from the pools in 1909. The first order, however, was never obeyed, as the papers were still on hand when District Attorney Wise called for them last year.

Judge Jacob M. Dickinson has so far assumed the leading part of the government's inquiry, having conducted the examination of all except one of the witnesses. In the cross examinations for the defense, Cordenio A. Severance and Richard V. Lindabury have been most active. Henry E. Colton, for the government, and David A. Reed and Raynal C. Bolling, for the Corporation, have also taken part in the examination of witnesses. Lincoln R. Clark appears with the government counsel. It is doubtful whether Attorneys Choate, Johnson and Stetson, for the Steel Corporation, and Wickersham, Pepper and Corneau, for the government, will appear during the hearings.

The hearings have now settled down into a regular routine. Barring delays due to the usual causes, the morning sessions open at 10:15 o'clock and adjourn at 12:30. The afternoon session is called to order at 2:00 o'clock, and generally lasts until sometime between 4:00 and 4:30 o'clock. No hearings will be held on Saturday, and it is very probable that none will be conducted on Friday afternoons. Henry P. Brown, special examiner, was not able to be present at all the sessions and he will probably be absent on a number of later occasions, as he has several important outside cases demanding some of his attention. His son, John A. Brown, of the Philadelphia bar, will take his place on such occasions.

From the nature of the examinations of last week and the limited scope of the testimony taken, the hearings will doubtless be prolonged for many months before all questions entering into the suit can be carefully threshed out.

The witnesses who appeared during the first week's examinations were Wallace Buell, Port Chester, N. Y., now retired, but formerly general sales agent of the Washburn & Moen Mfg. Co., Worcester, Mass.; George E. Holton, president and treasurer of the Bryden Horseshoe Co., Catasauqua, Pa.; James J. Bailey, formerly secretary to Edwin E. Jackson Jr., supervisor of the various wire pools; Harry A. Whitney, up to two months ago corresponding salesman of the American Steel & Wire Co., at Worcester, Mass.; William Derham, head of the wire specialties division of the United States Steel Products Co., New York; Karl G. Roebling, general sales agent of the John A. Roebling's Sons Co., Trenton, N. J.; George A. Cragin, assistant general sales agent of the American Steel & Wire Co., Worcester, Mass.; Frank Baackes, vice president and general sales manager of the American Steel & Wire Co., Chicago; Frank I. Newbury, general manager of the insulated wire department of the John A. Roebling's Sons Co., Trenton, N. J.; A. I. Findley, editor of the *Iron Age*, New York, and T. H. Taylor, assistant general sales agent of the American Steel & Wire Co., New York.

Harry A. Whitney, until two months ago a corresponding salesman in the electrical and wire rope department of the American Steel & Wire Co., at Worcester, Mass., was questioned by Judge Dickinson as to what had become of certain papers pertaining to the operations of the wire rope and electrical wire pools that had been under his supervision. Mr. Whitney stated that the last time he saw these papers they were in the boiler house of the North works of the American Steel & Wire Co., at Worcester, where they had been

taken at the order of Frank Baackes, vice president and general sales manager of the company.

"What did you do with the papers?" asked Mr. Dickinson.

"I put them in the boiler," answered the witness.

"To boil them?" interrogated the government counsel.

"To burn them," replied Mr. Whitney.

"What were Mr. Baackes' orders?" asked Mr. Dickinson.

"He said, 'See that these papers are destroyed,'" answered the witness.

Mr. Whitney stated that these orders were given by Mr. Baackes while on a visit to the Worcester works either in October or November, 1911.

"Did you examine the papers previous to the destruction?" was asked.

"I did, at Mr. Cragin's request," replied Mr. Whitney.

Ordered to Burn Papers

The witness stated that probably 1,000 papers relating to the wire rope and electrical wire pools were destroyed. The papers, he said, contained minutes of the wire rope association meetings kept by him, and also minutes of the meetings of the electrical wire association.

The witness stated that the American Steel & Wire Co. was a member of the wire rope pool until 1909. During this time, for about three years, beginning 1901, the pool was operated on the basis of allotment of output. He stated that during that time the American Steel & Wire Co. sold part of its products at prices fixed by agreement. After the association was discontinued in 1909, the company continued to quote the same prices as before. He said the American Steel & Wire Co. did not subsequently adhere to this price schedule in all cases, however.

In re-direct examination by Judge Dickinson, Mr. Whitney was asked whether he had had any conversation relative to the testimony he was to give with either Mr. Cragin or Mr. Baackes at the time of the grand jury investigation in New York in the summer of 1911.

"Mr. Cragin," said the witness, "said that Mr. Baackes wanted to see me. I went into the hall from the witness room and met Mr. Baackes. He asked me what I was going to say. I replied that I was going to say that he ordered me to destroy the papers. Mr. Baackes then told me to tell what I believed to be the truth, but said that he had never instructed me to destroy the papers. These instructions, he said, had been given by Mr. Cragin."

The witness stated that he had been considerably disturbed at the time as to who had given him the orders directly, but after carefully recalling the events, he was sure that Mr. Baackes was the one. Mr. Whitney stated that he wished he were not so sure of these matters since it was painful for him to have his remembrance of the incident differ from that of Mr. Baackes.

No Longer with Company

On examination by Mr. Bolling, Mr. Whitney said that he had severed his connection with the American Steel & Wire Co. on March 13 last, contrary to the wishes of his superiors.

William Derham, of Verona, N. J., head of the wire specialties division of the United States Steel Products Co., stated that prices made abroad were a shade below domestic prices on steel wire, steel rope, copper wire and copper cable. Several letters which passed between James A. Farrell, then president of the export company, and Mr. Cragin, referring to the prices to be charged on wire goods shipped abroad and to affidavits on shipments furnished to the steamship companies, were identified by Mr. Derham and introduced as evidence. Mr. Derham had written a number of these letters and Mr. Farrell had signed them.

Mr. Roebling Testifies

On Wednesday afternoon, Karl G. Roebling, of Trenton, N. J., was the first witness called to the stand by Attorney Dickinson. Mr. Roebling, for the past seven years, has been general sales agent for the John A. Roebling's Sons Co., of Trenton. The latter admitted that his company had been a member of the wire rope, bare copper wire and other associations, and identified a copy of the minutes of the meetings of the bare copper wire association which Mr. Dickinson handed him. Mr. Roebling stated he had first begun to attend these meetings in May, 1905. Mr. Dickinson then read a list of names of individuals who, the witness stated, represented various manufacturers of wire at the pool meetings. The method of operating the pools was then gone into in detail by Mr. Roebling, under the questioning of Mr. Dickinson. A number of letters, relating to prices which were to be quoted at certain times, which passed between Supervisor E. E. Jackson Jr., and representatives of the Roebling company,

Steel Corporation Wins First Legal Skirmish

The Steel Corporation is the victor of the first skirmish in the legal battle with the government in connection with the suit for dissolution. At Trenton, N. J., May 9, Judges Gray, Buffington and McPherson, of the United States Circuit Court, returned an order denying the government's prayer for an injunction to prohibit the Steel Corporation and its subsidiaries from destroying any records or papers that might be of importance in the pending suit. This prayer for an injunction was filed by the government on Feb. 6, following its being advised of the destruction by officials of the American Steel & Wire Co. of a trunkfull of papers and records pertaining to the various wire pools. In denying a sweeping injunction, the court made an exception in the case of the American Steel & Wire Co., against which a temporary restraining order is continued. In passing on the motion, the court stated:

The government asks us to restrain the principal defendant and others, all its subsidiary companies, from destroying books and papers, but without describing them except in very general terms. No evidence is offered that such destruction is threatened, and it need hardly be said that evidence is essential before any man may be either accused or convicted of what would be in substance a criminal interference with the course of justice.

The motion is supported almost wholly by the fact that after certain prosecutions in the southern district of New York came to an end a number of papers belonging to the American Steel & Wire Co., that had been furnished by the company to the government for use in such prosecutions and had been returned to its possession, were destroyed by one of its officers. While we are satisfied that this destruction was without evil intent, the fact remains that the destruction did take place, and we see no reason why (so far as the steel and wire company is concerned) the present order should not be continued.

But it is not known that the other defendants were in any respect connected with this act, and (so far as they are concerned) without evidence we cannot grant the present petition. It must be refused, except as to the steel and wire company, but the government has leave to make a similar motion at any time in the future if counsel shall regard such a step as necessary or desirable.

were offered as exhibits by Mr. Dickinson. In one letter, written in 1906 by Jackson, to the Roebling company, the former referred to the fact that members of the bare copper wire association were discussing its affairs too generally, and he stated that their motto should be "addition, division, silence." In another letter from Jackson to the Roebling company, the former complained of price cutting on the part of the American Steel & Wire Co., which interest had booked an order from the Delaware & Hudson company at low prices. Supervisor Jackson wrote that he feared some very low prices would be quoted the Delaware & Hudson company on the next lot of wire for which it inquired.

In reading from the minutes, Mr. Dickinson came across a passage where one member was given the right to make prices on certain gages of wire to be quoted to the Western Electric Co. In another meeting, as shown by the minutes, it was moved, seconded and unanimously carried that all prices quoted to the General Electric Co. be advanced 10 cents per 100 pounds.

Mr. Dickinson then took up the wire rope association which continued in existence to 1906 and 1907. Mr. Roebling identified the American Steel & Wire Co. and a few others as members.

After formally disbanding, Mr. Roebling admitted, the former members of the association met about every 30 or 60 days to discuss prices. At the latter meetings Messrs. Baackes and Cragin were in attendance. At these meetings a number of the representatives would announce the prices they would sell at and these announced prices would then be upheld by the various manufacturers until further notice.

In cross examination, conducted by Mr. Severance, Mr. Roebling stated that his company was also represented at meetings of the pool by F. J. Newbury, manager and general sales agent of the insulated wire department of the John A. Roebling's Sons Co. Witness stated that his company had the largest percentage of allotment in both the wire rope and bare copper wire pools. The last meeting of the bare copper wire association was held in March, 1909. As members of this association, he mentioned the Seymour Mfg. Co., the Waclark Mfg. Co., the Spargo Wire Co., and a number of others.

The taking of testimony on Thursday was presided over by John A. Brown, son of Special Examiner Henry P. Brown owing to the latter's inability to be present, because of important business in Philadelphia. The first witness, George A. Cragin, assistant general sales agent of the American Steel & Wire Co., at Worcester, Mass., delayed proceedings by not appearing until long past the opening hour of the hearings. He testified in answer to Attorney Dickinson's queries, that his company was a member of the wire rope, bare copper wire, weather-proof and magnet wire, underground power cable, rubber insulated and lead encased wire and one or two other associations.

In regard to the destruction of the records and minutes of the meetings and transactions of the various pools, Mr. Cragin stated that to the best of his memory, this occurred in the early part of November, 1911. Asked whether Mr. Baackes had given him any orders in the matter, Mr. Cragin stated the former, during a visit to Worcester either in October or November of last year, had asked:

"Have you destroyed those papers?"

"I replied, I would attend to the matter," answered the witness.

Morgan Partner Early Suggested Wire Combine

During the examination of James J. Bailey on Tuesday, Attorney Dickinson introduced a letter written in 1898 *by the late C. H. Coster, of J. P. Morgan & Co., to Judge E. H. Gary and the late John W. Gates, suggesting the consolidation of the principal wire manufacturing plants of the country. Mr. Lindabury objected to the filing of this letter as evidence on the ground that Messrs. Gary and Coster had nothing whatever to do with the formation of the American Steel & Wire Co. of New Jersey, and consequently this letter was not acted on. Later in another letter, Mr. Coster stated that owing to the great decline in wire profits, he questioned whether the bonds of the proposed combination could be floated on such a showing. He then declined to go ahead with the work. The American Steel & Wire Co. of New Jersey was finally financed by the Seligman interests.*

Farrell Ignorant of Pools.

Mr. Cragin stated that he never had any reason to believe that President James A. Farrell of the United States Steel Corporation knew of Supervisor E. E. Jackson, Jr., or of the existence of the various pools while he was connected with the United States Steel Products Co. No communications, either verbal or written, had been had by him with Mr. Farrell on these matters, he said. Something about the allotments of business and the periods over which the pools operated on the basis of allotment, were told by the witness. The membership of the wire rope association, Mr. Craigin said, included the John A. Roebling's Sons Co., the A. Leschen & Sons Rope Co., the Broderick & Bascom Rope Co., the Williamsport Rope Co., the Wright Wire Rope Co., the American Steel & Wire Co., and others.

After the various pools were disbanded, representatives of the former members often met at informal luncheons in New York, said Mr. Craigin. These luncheons, he said, were attended by Henry Leschen, of the A. Leschen & Sons Rope Co., George Wright of the Wright Wire Co., Mr. Cochran of the Williamsport Wire Rope Co., F. G. Newbury, or K. G. Roebling of the John A. Roebling's Sons Co., by himself and others. Supervisor Jackson never attended or was represented at the meetings, he said. The manufacturers, as a rule, would announce the prices at which they would do business and these prices were then adhered to until a new announcement was made.

After breaking up of the weather-proof and magnet wire association, Mr. Cragin stated that competition was greater and there was more fluctuation of prices. The same was true in underground power cable and the rubber and lead encased cable prices. In wire rope there was no marked change in price until about a year after the pool had been discontinued.

"Did you not in February or March, 1912 in the post office building at New York City, state to H. E. Colton and L. R. Clark (of government counsel) that you had talked to Mr. Farrell about these pools?" asked Mr. Dickinson.

"I remember no such conversation," replied Mr. Cragin.

Mr. Lindabury objected to the line of inquiry on the ground that this evidence had been previously submitted to the grand jury. He said the government counsel's methods at the hearing resembled the Spanish Inquisition.

Allotments of the Pools.

On the cross-examination by Mr. Severance, of Corporation counsel, the witness said the allotment of

the American Steel & Wire Co. in the bare copper wire association, was 11 per cent of the pool's business. Two other companies, the John A. Roebling's Sons Co. and the Standard Underground Cable Co., had larger allotments. In the weatherproof magnet pool, the American company had 12 per cent and its share was also exceeded by the allotments to the Roebling and Standard companies. The Spargo Wire Co. and the General Electric Co never joined this pool. In the rubber covered wire association, the witness said the American Steel & Wire Co. was allotted 8 per cent of the pool's business. The Roebling company, the Standard Underground Cable Co., the New York Insulated Wire Co., the Safety Insulated Cable & Wire Co., and the Simplex Electrical Co. were all given larger portions. This pool, Mr. Cragin stated, controlled about 65 per cent of the business of the country. In the underground power cable association the Steel & Wire company's allotment was 12 per cent; in the rubber insulated and lead encased wire association, about 15 per cent; and in the wire rope association, about 23 or 24 per cent. This latter pool, the witness stated, was organized in 1885, and the American Steel & Wire Co. became a member of it shortly after absorbing the Washburn & Moen Mfg. Co.

Mr. Cragin stated that the American Steel & Wire Co. was the first company to leave the various pools in the spring of 1909, except in the case of the rubber covered wire association. He said that at the informal meeting following the abandonment of the pool, no steps were ever taken to regulate the output of the various companies. Mr. Cragin stated that he had never had any communication with Judge Gary regarding pool matters. In answer to Mr. Dickinson's query, he said the figures and percentages as given, were averages for the full life of the agreement.

With Mr. Severance questioning, Mr. Cragin stated that in May or June, 1911, he brought to New York under the order of District Attorney Wise, the papers concerning the various pools, which were later destroyed. These papers were returned to Worcester in October or November. The witness said he had helped the district attorney to put the papers in shape.

Baackes on the Stand.

Frank Baackes, vice president and general sales manager of the American Steel & Wire Co., went on the stand in the afternoon and was examined by H. E. Colton for the government, regarding his knowledge as to the formation of the American Steel & Wire Co. of Illinois. The witness stated that he could give little information on the subject as he came in contact with the late John W. Gates only in connection with the negotiations for the ownership of the Salem Wire Nail Co. Mr. Baackes was the head of this company. After the organization of the Illinois company, Mr. Baackes was made general manager of the operating department.

Mr. Colton inquired regarding the wire nail pool which was organized in 1896 and continued in force until 1904.

"Was competition keen?" asked Mr. Colton.

"We always made money under it" answered Mr. Baackes.

"Why did you form a pool?"

"To make more money."

"What was the general effect of this pool on prices?" counsel pursued further.

"They were higher," replied the witness.

In regard to the price agreements, Mr. Baackes stated that he had tried to act in accordance with them but that they were never religiously kept by the various companies in the pool. Asked whether Messrs. Schwab, Corey or Gary had ever attended any of the pool meetings, witness recalled having seen Mr. Schwab present at one meeting of the wire nail pool.

"Were you in Worcester in November of last year?" asked Mr. Colton, veering the examination around to the question of the destruction of the pool records.

"I think once," said Mr. Baackes.

"Do you recall stating in my presence last February that you were in Worcester twice in November of last year and not in October?" Mr. Baackes replied that he could not recall what he said.

"Do you think it to the general welfare to fix bids for the United States government?" asked counsel.

"No," said Mr. Baackes.

Under cross-examination conducted by Mr. Lindabury, Mr. Baackes stated that although some pools had been recognized none had been originally formed since the organization of the United States Steel Corporation. In none of the pools did the American Steel & Wire Co. enjoy the largest allotment, he testified. The witness further stated that only 3 per cent of the output of the wire company was controlled by the pools and that this was less than one-half of 1 per cent of the entire output of the Steel Corporation subsidiaries.

Got out of all Pools.

"When did the pools break up?" asked Mr. Lindabury.

"In the spring of 1909."

"How did it come about?"

"I was ordered by Charles MacVeagh, counsel for the Corporation, to get out of them," said Mr. Baackes. "Judge Gary called me into his office and asked me if I were in a horseshoe pool and I answered 'yes'. He told me to see Mr. MacVeagh immediately and discuss the matter with him. I saw Mr. MacVeagh and he told me that the pools were illegal. This greatly surprised me as Supervisor Jackson had always told me they were legal. Jackson, MacVeagh and I had a lengthy conference at the conclusion of which MacVeagh told me I would have to get out of the pools. This I immediately did."

This statement was entered in the record under the objection of government counsel.

Mr. Baackes stated that after the termination of the pools in 1909 he had ordered the papers and records destroyed. It appeared, however, that this order was never obeyed, for they were still on hand when District Attorney Wise wanted them. After the latter stated he was through with them, Mr. Baackes said, he ordered either Mr. Taylor or Mr. Cragin to have them destroyed.

"What conversation did you have with Mr. Whitney after you testified before the grand jury and just before he testified?"

"I said: 'What are you going to say?' He replied: 'That you told me to destroy the papers.' "

"I said: 'I never told you to destroy the papers. But you testify what you believe to be the truth.' "

"Did you ask Mr. Whitney to resign?" asked Mr. Lindabury.

"I refused to accept his resignation when he offered it," said Mr. Baackes.

Possible Effect on Prices

A. I. Findley, editor of the *Iron Age*, the first witness up on Friday morning, was questioned by Judge Dickinson as to the accuracy and authenticity of certain price charts published by the *Age*, which the government wished to file in the testimony. These charts contained the records of prices on pig iron,

barbed wire, wire nails, beams, steel rails, cut nails, etc., from the early 90's up to the present time. By presenting these charts it was intended to show the effect which the wire and other pools had had on the market at different times. In cross examination by Mr. Lindabury, the counsel for the Corporation endeavored to show by these price charts that prices have constantly shown a tendency toward lower levels since the organization of the Steel Corporation in 1901.

Thomas H. Taylor, of Montclair, N. J., assistant general sales agent of the American Steel & Wire Co., at New York, testified as to his connection with the American Steel & Wire Co. of Illinois, and what he knew of the competitors of that company. His examination was very short.

Frank J. Newbury, general manager of the insulated wire department of John A. Roebling's Sons Co., testified as to the proceedings of the rubber-covered wire association. He stated, in answer to Judge Dickinson's queries, that he had often seen Messrs. Frank Baackes, George A. Cragin, R. A. Keyes, C. W. Bassett and other representatives of wire manufacturers, present at the meetings of the pool. After disbanding the pool, the witness stated, practically the same firms were represented at the informal luncheons in New York in the course of which prices were announced. This was also the case, Mr. Newbury stated, with the weatherproof and magnet wire association. Witness was then handed a copy of the minutes of the weatherproof and magnet wire association, and asked to read the following entry, which was dated Nov. 16, 1905:

As to "Open" Prices.

"It was moved, seconded and unanimously carried that the price of magnet wire to be quoted the General Electric Co. and the Westinghouse Electric & Mfg. Co. shall be left open."

The term "open," the witness stated, meant that no certain prices would be fixed on magnet wire to be sold to this buyer.

"It was moved, seconded and unanimously carried that the printed price of magnet wire shall be ¼c higher than the minimum price," was another entry which appeared under date of Dec. 14, 1905.

A letter which was produced and read by counsel was of unusual interest as showing the difficulty experienced by the supervisor in keeping the members of the various pools in a state of satisfaction. Writing for E. E. Jackson Jr., on June 23, 1909, L. V. Hubbard, of the law firm of Noble, Jackson & Hubbard, of New York, informed Mr. Newbury of the forfeiture of $2,203.21 due from the Roebling company, only $1,980.58 had been paid in, thus leaving a balance of $222.63 due the association. This letter elicited the following response from Mr. Newbury:

Dissensions in Pool.

"I have yours of the 23rd inst. in reference to adjusted bulletin 279½ giving figures for April 30. In looking over these figures I find the results tabulated on the attached sheet. You will notice that I shot up from one-third of 1 per cent to seven-eighths of 1 per cent over (allotment) and then back again. This behavior on my part is not due to what I did myself but to what other people did to me. I find some people who behaved the other way. Mr. Remington was more under on settlement day than immediately before or after. Mr. Smith seemed to have cancelled all his orders about settlement day and reinstated them later. Mr. Wallace probably did the same thing. Mr. Cragin seems to have reduced his percentage of overs for settlement purposes only as he was back again on May 8. It is easy enough to cancel all the orders that you have on the books when the settlement period comes and reinstate them the week after, or it is easy to hold up orders and not enter them until after the settlement period. I am somewhat curious and I believe I have a right to ask questions as to the way these things happen."

Mr. Newbury stated that the object of the association was to maintain prices at a fair level. He testified that the Roebling company had the largest allotment in the weatherproof and magnet wire pool.

The hearing adjourned until Monday morning.

Director Reid Testifies.

John A. Brown presided over the Steel hearings on Monday morning, as his father, Henry P. Brown, special examiner, was again detained in Philadelphia. Daniel G. Reid, director of the Steel Corporation, chairman of the Chicago & Rock Island railroad, director of the Chicago & Eastern Illinois, and of the Liberty National, and numerous other banks and trust companies, was called to the stand by Judge Dickinson. Mr. Reid stated that he is a stockholder in the Steel Corporation, but, on advice of counsel, refused to say how large his holdings are. Asked as to his connection with the tin plate industry, he said that he had been president of the American Tin Plate Co., and, prior to that, treasurer of the American Tin Plate Co., of Ellwood and Montpelier, Ind. Mr. Reid was questioned and answered at length regarding the products and the markets of the various manufacturers which were later merged into the American Tin Plate Co. He had no exact information, but stated what he remembered in a general way. Mr. Dickinson questioned him as to the part he took in the formation of the American Tin Plate Co. Witness stated that he had had several conversations with Judge W. H. Moore on the subject and that he had introduced the latter to a number of persons who, he thought, would be interested. Personally, however, he stated, the only part he took was in the negotiations which led to the sale of the American Tin Plate Co., of Ellwood and Montpelier, Ind., and in underwriting the securities of the larger interest. The witness explained how the syndicate took over the various mills. Cash was offered if the owners wanted it, or stock could be had. Mr. Dickinson asked if it were not true that some mill owners had been offered from two to four times the value of their properties. Mr. Reid, however, did not remember, or did not know how much was received by the various mill owners or what arrangements had been made for the exchange of stock. He stated, in answer to Judge Dickinson's inquiry, that the $18,000,000 preferred stock represented the actual value of the various properties and plants taken over and that for every share which the underwriters paid, they received a share of common stock as a bonus. Asked about the surplus capital of $10,000,000, the witness stated that he had received some of it.

Effect on Prices

Mr. Reid next stated that he had been one of the underwriters of the National Steel Co. When questioned as to the amount of steel purchased by the American Tin Plate Co., he set the requirements of the latter at about 500,000 tons per annum, a good deal of this being purchased from the National Steel Co. The witness was also asked as to the effect on prices of the formation of the American Tin Plate Co. It developed that the tendency of prices for the few years following that event was upward.

Judge Dickinson was noticeably annoyed by the witness' poor memory as evidenced throughout his testimony and particularly in reference to certain alleged contracts, which the government was endeavoring to run down.

"Do you remember that the American

Tin Plate Co. made contracts with manufacturers of machinery, rolls and housings, providing for taking all their output?" asked counsel.

"I do not remember," answered Mr. Reid.

"Did you make contracts with manufacturers of tin plate machinery to take their entire outfit so that independent manufacturers of tin plate would have to go abroad for their equipment?"

"I have no recollection of such contracts," answered the witness.

"Did you not testify before the Industrial commission at the time of the formation of the Steel Corporation in 1898 that you had made contracts with about two-thirds of the makers of such machinery in this country?"

Mr. Reid stated that he knew nothing of these contracts, but that the late Warner Arms, of Niles, O., had probably drawn them up. Asked if anybody now alive knew about these matters, witness mentioned W. T. Graham, at the Plaza hotel, New York City, formerly vice president of the American Tin Plate Co., and now president of the American Can Co.

"Did you sign contracts with jobbers only on condition that they would assign their brands to you?"

"I know nothing of such contracts," said Mr. Reid. "They would have come under the supervision of the sales department."

"When did you take over the Champion Iron & Steel Co., of Muskegon, Mich.?"

"Within two years of the formation of the American Tin Plate Co.," said Mr. Reid.

The witness admitted that the Champion company was a new concern at the time; also that it was a competitor in the general market, particularly in Detroit. The Sharon Tin Plate Co., Sharon, Pa., was brought up next. Mr. Reid did not remember any contracts by which the American Tin Plate Co., of which Mr. Reid was president, was to take over the Sharon output for five years. Mr. Reid did not remember whether Sharon and Champion were six-mill or four-mill plants. Mr. Reid also had forgotten any contracts which might have been made with steel plants for the supply of tin bars to the American company.

Tin Plate History

In cross examination by Mr. Severance, of Corporation counsel, Mr. Reid stated that the tin plate industry in this country began about 1891, when the McKinley bill was passed. His company, the American Tin Plate Co., of Ellwood, Ind., was formed in 1891. W. B. Leeds was Mr. Reid's partner. The company was originally projected with the intention of developing the town. The first year was very disastrous; the second year showed little better result and it was not until 1894 that anything satisfactory was shown. At the time of the formation of the American Tin Plate Co., the tin plate business was not in good condition, a good many mills being in distress. One of the first persons to suggest amalgamation to Judge Moore was John A. Wheeler, of the Great Western Tin Plate Co., Joliet, Ill. The intention in forming the American Tin Plate Co., said Mr. Reid, was to reduce overhead charges by merging the smaller plants, buying in larger lots, etc. "Also to make the big steel mills take a look at us and not send down some sidelight occasionally to take an order," added the witness.

Federal Trust Prober Defends Corporation

Cordenio A. Severance, of counsel for the Steel Corporation at the hearings, has been prominent in recent years by his connection with various important litigations between the government and large corporations. He was aligned with the government counsel in some of the most conspicuous of these cases. Mr. Severance tried the case for the federal authorities against the Union Pacific and Southern Pacific railroad merger before the United States Supreme Court. He also assisted Frank B. Kellogg in the anti-trust prosecution of the Standard Oil Co. Mr. Severance is a native of Minnesota and about 49 years of age. He was educated in a western college and for the past 25 years has been connected with the firm of Davis, Kellogg & Severance, of St. Paul, the senior partner of which was the late United States Senator Davis, of Minnesota. During this period, Mr. Severance acted as counsel for a large number of ore and iron companies, including the Duluth & Iron Range railroad, the Minnesota Iron Co. and others. These connections were formed a number of years before the organization of the United States Steel Corporation in 1901.

Mr. Reid produced some statistics, compiled in his presence at the Steel Corporation offices. These showed that the Corporation owned 235 tin mills, compared with 202 owned by independent companies. The production of the Corporation mills was 53.7 and of the independent companies 46.3 per cent of that of the country.

Cause of Advance in Prices

Mr. Reid was questioned further with a view toward showing that the advance in prices immediately after the formation of the American Tin Plate Co. was not due to such formation, but was caused by the usual conditions, such as changes in prices of raw materials, which bring about fluctuations both upward and downward. Mr. Reid stated that there never was a "tin plate pool" that he knew anything about. Counsel read a list of various independent tin plate companies, which have all been formed since the formation of the American Tin Plate Co. Several of these the witness described as being "very large and very successful".

The principal reason for the organization of the National Steel Co. was that the American Tin Plate Co. might have a source of supply for its steel. Its capacity was much larger, however, than the Tin Plate company required, and the American Steel Hoop Co. was then organized in order to secure another customer. When the Steel Corporation was organized, said Mr. Reid, Judge H. H. Moore followed his usual practice and held a consultation with Mr. Reid, the late W. B. Leeds and J. A. Moore, in regard to what should be done with the various companies over which these four men were the controlling forces. These were the American Steel Hoop Co., the American Sheet Steel Co., the American Tin Plate Co. and the National Steel Co. At this consultation, it was decided either to sell out everything to the Corporation or keep all. The four companies, as a result, were sold.

Hoped for Better Prices

In re-direct examination by Judge Dickinson, the witness stated that the American Tin Plate Co. was formed primarily to lower the cost of production. He also admitted that the promoters had hopes of getting a better price for their products. The witness stated that some mills were taken into the merger purely as a matter of sentiment. As an example, he mentioned the Irondale Steel & Iron Co., Middleton, Ind., of which concern George Laughlin was the head. This company would otherwise have gone into receivers' hands, he said.

Jacob Meurer, of Brooklyn, N. Y., was next called to the stand by Judge Dickinson, to relate his experiences resulting from the formation of the American Tin Plate Co. He stated that he operated a dipping plant, in which he dipped black sheets rolled at other plants. He stated that the American Tin Plate Co. refused to sell him black sheets for about two years after its organization. As he could not obtain this product anywhere else in this country, he was forced to import it, paying from $15 to $20 a ton above the domestic

market price. Mr. Meurer stated that other dippers fared the same way, and that, as a result, a meeting was held in New York in the summer of 1899, at which the situation was earnestly discussed. There were present representatives of C. S. Trench, Merchant & Co., Follansbee Bros Co. and others. Later on, Follansbee Bros. erected their own rolling mill.

"Did Follansbee Bros. erect a sheet mill shortly afterward?" asked Mr. Lindabury in cross-examination.

"They did," answered Mr. Meurer.

"Did they sell sheets to the other dippers?" pursued counsel.

"They did not," answered witness.

"Then they must have been selfish like everybody else."

"Yes," laughed Mr. Meurer.

FURTHER REDUCTION

On Lake Cargo Coal From Pittsburgh to Ashtabula is Asked.

In the case of John W. Boileau against the Pittsburgh & Lake Erie railroad, the Lake Shore & Michigan Southern, and other railroads, before the Interstate Commerce Commission, the petitioner has filed an application for the modification of the order entered March 16, 1912, to take effect May 1, 1912. He states that since the date of the order, circumstances have arisen which entirely change the position as presented to the commission when the case was heard, and he asks that the commission further reduce the rate on lake cargo fuel from the Pittsburgh district to Ashtabula harbor in such an amount as shall be just and reasonable.

Mr. Boileau recites that reductions made by carriers since the decision of the commission leave the differentials practically identical with the differentials which formerly existed, and which the commission condemned. Several changes are cited; for instance, the Baltimore & Ohio has reduced its rate on lake cargo from the Fairmont district in West Virginia from 96¾ cents per ton to 90 cents per ton. The differential between the 96¾-cent rate and the 88-cent rate which existed before the order of the commission was made was 8¾ cents. By the reduction of the Pittsburgh-Ashtabula rate to 78 cents, the commission created a differential of 18¾ cents in favor of the Pittsburgh district, but by the rate now put in by the Baltimore & Ohio, the differential under the Fairmont district rate is changed to 12 cents instead of that contemplated, 18¾ cents.

STEEL GROUP

Will be Called Algoma Steel Corporation, Ltd.

Toronto, May 13.—In accordance with the general plan adopted by the executive committee of the Lake Superior Corporation of Sault Ste. Marie, Ont., of consolidating its subsidiary companies into natural groups, each of which will be independently financed and managed, arrangements have been effected for the consolidation of the steel group comprising the following: The Algoma Steel Co., Lake Superior Iron & Steel Co., Lake Superior Power Co., Fiborn Limestone Co., Cannelton Coal & Coke Co., and Algoma Iron Works. The new company will be entitled "The Algoma Steel Corporation, Ltd.," with an authorized capital of $30,000,000 and bond issue of the same amount. An immediate bond issue of $13,000,000 has been underwritten to provide for the retirement of outstanding notes given to secure funds for extensions and improvements. The new arrangement will not place additional charges on the Lake Superior Corporation, but the bonds will be guaranteed by it.

The Grand Trunk railway has contracted for 6,000 additional box cars to meet increased traffic demands, and additions to the motive power will also be made.

It is officially announced that the Toronto Electric Power Co. will at once begin the erection of a duplicate transmission line between Toronto and Niagara Falls at a cost of over $500,000. The new line will require separate towers and it is estimated that the increased power capacity will meet all demands for the next ten years.

The Canadian department of trade and commerce has been notified of a change in the South African tariff, giving Canada a preference of 3 per cent on wire fencing.

The Brown Construction Co., Ltd., Winnipeg, has secured from the Canadian government a contract for the St. Andrews lock bridge at about $150,000. The contract calls for a bascule lift span to be operated by electricity in opening and closing for the passage of boats. About 500 tons of steel and 25,000 cubic yards of concrete will be required.

The Quebec harbor commission has decided on building a million-bushel capacity elevator of concrete and steel construction, with links capable of being extended and developed into a similar structure.

The citizens of St. Catharines, Ont., have adopted a by-law giving a free site and a fixed assessment of $5,000 for ten years to the Canadian Warren Axe & Tool Co., which agrees to put up buildings to cost $40,000 and pay $25,000 annually in wages.

ORE ON DOCKS

Amount 1,000,000 Tons Smaller Than on May 1, 1911.

Statistics gathered from the *Marine Review* from the various dock managers at Lake Erie ports show that the amount of ore on Lake Erie docks May 1 of the present year was 5,881,245 tons, as against 6,850,285 tons in 1911, a decrease of 969,040 tons.

The total rail shipments from Lake Erie ports to furnaces during the winter season (Dec. 1 to May 1) aggregate 3,250,419 tons, viz.:

On dock Lake Erie ports, Dec. 1, 1911	9,131,664
On dock May 1, 1912	5,881,245
By rail to furnaces, winter of 1911-12	3,250,419

Adding these winter shipments to 23,178,370 tons, the amount shipped to furnaces during the navigation season of 1911, gives 26,428,789 tons as the entire consumption of ore from Lake Erie ports during the year ended May 1, 1912, as against 32,636,692 for the year ended May 1, 1911; as against 33,599,013 tons for the year ended May 1, 1910; as against 20,524,523 tons for the year ended May 1, 1909; as against 31,692,446 tons for the year ended May 1, 1908; as against 30,099,769 tons for the year ended May 1, 1907; as against 28,984,358 tons for the year ended May 1, 1906; 20,057,070 tons for the year ended May 1, 1905; 18,739,995 tons for the year ended May 1, 1904; 21,905,251 tons for the year ended May 1, 1903; 17,216,065 tons for the year ended May 1, 1902; 14,465,260 tons for the year ended May 1, 1901; 15,882,881 tons for the year ended May 1, 1900; 12,122,982 tons for the year ended May 1, 1899, and 10,209,488 tons for the year ended May 1, 1898.

The following table gives the amount of ore on dock at the close of navigation last year and the opening this year:

Ports.	May 1, 1912.	Dec. 1. 1911.
Toledo	356,102	661,382
Sandusky	2,471	2,471
Huron	257,496	344,371
Lorain	287,294	314,321
Cleveland	1,363,696	1,589,491
Fairport	381,705	636,566
Ashtabula	2,108,749	3,295,862
Conneaut	229,462	1,237,573
Erie	585,150	636,274
Buffalo	309,120	413,353
	5,881,245	9,131,664

Staggering Royalties for Hill Ore Properties

Will Probably be Demanded—Mr. Hill's Unbounded Faith in Their Future—Some Lands Soon to be Released

St. Paul, May 13.—Following a visit of inspection to Great Northern iron ore properties on the Mesabi range by L. W. Hill, D. M. Philbin and A. M. Chisholm, the decision has been made by the trustees of Great Northern ore certificates that no steps will be taken at this time looking toward the leasing of any Mesabi range lands held by them. This is not understood to indicate that, at no future time, will there be any leases given, but it settles the policy of the trustees for the present.

D. M. Philbin, who has been general superintendent of the Mesabi division of the Great Northern road, and as such has had most to do with the development of these lands, and who was primarily instrumental in their purchase, has been given charge of all active work in connection with these lands and is now in conference with contractors as to the feasibility of stripping a considerable area in several tracts, so that the company may be in position to mine not less than 3,000,000 tons a year, beginning with 1915. The Great Northern will be called upon to move a tremendous tonnage from these lands from now to the close of 1914, and does not want to be placed in the position of losing a great traffic for subsequent years. While there is little doubt that there will be a falling off of tonnage after the expiration of the Steel Corporation lease, this will be by no means severe if the road is ready to step in and mine for the market.

Mr. Hill's Position

Since it became known, some weeks ago, that the Oliver Iron Mining Co. was to release to the Great Northern road its interest in all the latter's lands upon which no mining has been done, a number of prominent eastern ore miners and consumers have called on the Great Northern for an opportunity to get leases on some of these tracts, but they have failed to do so. Perhaps the reason for this lies in the fact that they were anxious to get ore on some royalty rate that was based on the selling price of iron ores this spring, which Mr. Hill was not willing to concede as a reasonable price for the future. The gossip is that he believes the low price of ore for this year to have been inspired in part from the hope that it would have a bearing on the rate at which his ores might be leased. Be this as it may, Mr. Hill has the same firm faith in the value of Mesabi ores in the ground that he has always had, and is as high in his opinion of their worth as if they were still under lease to the Steel Corporation. He expects to get as much out of them as though they were yet in the famous Corporation lease.

Properties to be Opened

The Great Northern expects that most of the properties that are now under operation on its lands by the Steel Corporation will have more or less ore left in them at the close of the present lease, the exception being, perhaps North and South Uno and Dale, and it may be Mace and Mississippi. Leonard can scarcely be mined out nor can Hill and other properties of the leasehold. Indeed, it is more than probable that Mace and Mississippi will have some ore left on Jan. 1, 1915. What ore is left on these lands will be in condition for immediate mining by the Great Northern itself, or by others, as soon as the season of 1915 begins.

In addition to these there will be other properties opened by some mining company that will be organized by the trustees to carry on their work. It is probable that one of the first mines to be so opened will be the southwest one-fourth of section 27-58-20, a large body of ore held by the Great Northern under a 30-cent lease, and which is even now partially stripped by means of operations that have been carried on adjoining it. This is known as the "Adams lands", and was leased to the Great Northern by J. B. Adams and associates, of Duluth, after they had in vain attempted to get the Steel Corporation to take it up. It is the property, in fee, of the J. S. Pillsbury estate et al., who receive a royalty of 25 cents a ton on a minimum of 100,000 tons a year. Another property to be opened at once is one lying just west of the Mahoning mine, near the Uno, in section 3-57-21. Others will be taken up from time to time.

While it is stated that there will be no mines given out on lease at present, it is not at all certain that something of this sort will not be done later. But the royalty to be demanded will be such as to stagger most ore men. Under the present lease the Steel Corporation is paying this year $1.02 for ore of the standard of the lease, namely 59 per cent dry. Based on the amount of ore in the Great Northern's holdings and the minimum of the present lease, there will be an average royalty charge on what now remains in the ground of about $1.75, and it is doubtful if Mr. Hill will be willing to lease his tonnage at a very much lower figure than that, based on the same standard base as the present lease. If he maintains this attitude of mind, there is no probability that any important leases will be made for some time to come. But the Great Northern is financially very strong, and Mr. Hill says that his certificate holders are entitled to all they hoped for from his earlier statements, and if there is not enough to repay them in the royalty profit only, then they should have the royalty and mining profits combined.

President L. W. Hill, of the Great Northern road, is now in the far west, and upon his return to St. Paul there will be a statement of the probable course of the trustees, the same to be issued for the benefit and information of holders of the ore certificates.

New Tin Plate Plant Planned

The Pittsburgh Sheet & Tin Plate Co., Morgantown, W. Va., is planning a new plant to be composed of five hot mills, five tin mills, planishing plant and ten tinning stocks. This company is the outgrowth of the old Union Sheet Steel Co., and proposes the merger of the Hazelton Sheet Steel Co., the Marietta Sheet Steel Co. and one at Bellington, W. Va. The same interest that promoted the Union Sheet Steel Co. is understood to be back of the new proposition.

The Southern Iron & Steel Co. has given the miners employed by the company in Gadsden, Ala., district an increase in wages amounting to 2½ per cent.

BLAST FURNACE

From Early to Modern Times Pictured by Bradley Stoughton.

New England foundrymen held one of the largest and most important get-together meetings in their history at the Allyn House, Hartford, Conn., Wednesday, May 8. On that occasion, the Connecticut members acted as hosts for the New England Foundrymen's Association and its friends, and they proved to be most generous entertainers. The attendance from Boston, New Haven, Hartford, and other New England points was large and fully 300 sat down to the sumptuous dinner served at 6 o'clock. The subject for discussion of the evening was the "Principles of Blast Furnace Practice," which was presented by Bradley Stoughton, of New York, with the aid of stereopticon views. Mr. Stoughton outlined the development of the blast furnace from primitive to modern times and illustrated the different types of furnace and the most approved methods of present day practice. In the speech-making line, with Charles L. Newcomb, president of the association, presiding, the participants were Mayor Chaney, of Hartford; Ex-Mayor Farnsworth, of New Haven and of the McLagon Foundry Co.; Samuel Colt, president of the Richmond Iron Works, Richmond Furnace, Mass.; C. E. Whitney, president of the Employers' Association, and others.

Delegations of the visiting foundrymen that arrived in Hartford earlier in the day accepted the invitations tendered and visited the plants of the Pratt & Whitney Co., the Underwood Typewriter Co., the Pope Mfg. Co., the Whitney Mfg. Co., and other foundries and points of public interest of the city.

FILES REPORT

American Bridge Co.'s Condition on April 1.

The American Bridge Co., a corporation organized under the laws of New York, reports the following statement of its condition as of April 1, last, to the secretary of the commonwealth of Massachusetts:

Assets:—	1912.	1911.
Machinery	$ 301,704	$ 270,741
Materials used in erecting.	31,276	52,486
Cash and debts receivable.	7,397,113	10,383,367
Total	$7,730,093	$10,706,594
Liabilities:—		
Capital stock	$ 100,000	$ 100,000
Accounts payable	7,597,021	10,573,327
Profit and loss	33,072	33,267
Total	$7,730,093	$10,706,594

The Chicago Automatic Screw Machine Co., Chicago, has changed its name to the Chicago Automatic Machine Co.

STATISTICS CONCERNING UPPER LAKE ORE DOCKS

W. A. Clark, chief engineer of the Duluth & Iron Range railroad, has prepared a table giving particulars of the ore-loading docks on the great lakes, which now number 37. Three of these docks are constructed of steel and concrete, Nos. 1 and 6, at Two Harbors, and No. 2 of the Lake Superior & Ishpeming railway, at Presque Isle, which latter is expected to be ready to go into commission on Aug. 1. It will be noted of the Duluth & Iron Range railroad, that the table includes information not hitherto compiled giving the capacity of pockets to the basis of the number of carloads each pocket will hold.

RECORD OF OLD AND NEW RANGE ORE LOADING DOCKS.

Railway—Location.	Dock No.	Number of pockets.	Capacity per pocket cars, tons.	Storage capacity gross tons.	Height water to center hinge hole. ft. in.	Height water to deck of dock. ft. in.	Width of dock outside to outside of part'n posts. ft. in.	Length of spouts. ft. in.	Length of dock. ft. in.	Angle of pockets. deg. min.	Cu. ft. per pocket to bottom of stringers.
Chicago & Northwestern Ry., Escanaba	3	226	2 @ 50 1 @ 25 2 @ 50	28,250	31 2	52 8	37 0	27 0	1,356	45 0	1,969
Chicago & Northwestern Ry., Escanaba	4	250	1 @ 25	31,250	36 6	59 2	37 0	30 0	1,500	45 0	2,191
Chicago & Northwestern Ry., Escanaba	5	370	5 @ 50	92,500	37 9⅝	73 9	52 2	32 1½	2,200	45 0	4,142
Chicago & Northwestern Ry., Escanaba	6	320	5 @ 50	80,000	40 0	70 0	53 2	30 0	1,920	45 0	4,114
Chicago & Northwestern Ry., Ashland, Wis.	1	234	4 @ 50	46,800	40 0	70 0	50 2	30 0	1,404	45 0	3 915
Chicago & Northwestern Ry., Ashland, Wis.	2	234	4 @ 50	46,800	40 0	70 0	50 2	30 0	1,404	45 0	3,915
Total		1,634		325,600							
Duluth & Iron Range Ry., Two Harbors, Minn.	1	208	5 @ 50	52,000	39 3	74 0	51 8	34 0	1,376	48 0	4,075
Duluth & Iron Range Ry., Two Harbors, Minn.	2	208	3 @ 50	31,200	33 5	57 6	49 0	27 0	1,280	38 42	3,006
Duluth & Iron Range Ry., Two Harbors, Minn.	3	170	3 @ 50	25,500	40 0	66 0	49 0	27 0	1,054	43 32	3 006
Duluth & Iron Range Ry., Two Harbors, Minn.	4	168	3 @ 50	25,200	37 0	62 0	49 0	29 0	1,042	38 42	3,270
Duluth & Iron Range Ry., Two Harbors, Minn.	5	168	3 @ 50	25,200	39 0	66 9	49 0	30 0	1,050	43 32	3,126
Duluth & Iron Range Ry., Two Harbors, Minn.	6	148	5 @ 50	37,000	40 0	73 0	51 3¼	32 4	920	45 0	4,272
Total		1,070		196,100							
Duluth, Mesabi & Northern Ry., Duluth, Minn.	2	384	2 @ 50	38,400	32 0	57 6	49 0	27 9	2.336	45 0	2,368
Duluth, Mesabi & Northern Ry., Duluth, Minn.	3	384	3 @ 50	57.600	40 7	67 ½	59 0	27 9	2,304	45 0	2,782
Duluth, Mesabi & Northern Ry., Duluth, Minn.	4	384	4 @ 50	76,800	41 9½	72 6	57 0	30 1½	2,304	45 0	3,867
Total		1,152		172,800							
Great Northern Ry., Superior, Wis.	1	374	6 @ 50	112,200	40 0	73 0	62 8	32 4	2,244	45 0	4,872
Great Northern Ry., Superior, Wis.	2	350	6 @ 50	105,000	40 0	73 0	62 8	32 4	2,100	45 0	4,972
Great Northern Ry., Superior, Wis.	3	326	6 @ 50	97,800	40 0	73 0	62 8	32 4	1,956	45 0	4,972
Great Northern Ry., Superior, Wis.	4	302	7 @ 50	105,700	40 2	75 0	62 6	34 6	1,812	47 30	5,347
Total		1,352		420,700							
Duluth So. Shore & Atlantic Ry., Marquette	4	200	2 @ 50 4 @ 50	20,000	27 9	47 3	36 8	21 1	1,200	39 45	1,839
Duluth So. Shore & Atlantic Ry., Marquette	5	200	1 @ 25	45,000	40 0	70 10	51 0	32 4	1,236	45 0	3,848
Total		400		65,000							
Lake Sup'r & Ishpeming Ry., Marquette, Mich.	1	200	2 @ 50 1 @ 25	25,000	33 9	54 0	50 0	27 7	1,200	38 40	2,713
Lake Sup'r & Ishpeming Ry., Marquette, Mich.	2	200	5 @ 50	50.000	43 0	75 0	54 0	35 0	1,200	45 04	4.590
Total		400		75,000							
Minneapolis, St. Paul & Soo Ry., Ashland, Wis.	1	314	2 @ 50	31,400	43 0	66 2	36 0	27 0	1,908	50 45	2,435
Minneapolis, St. Paul & Soo Ry., Sup'r, Wis.	1	200	6 @ 50	60,000	42 5⅜	78 0	58 0	32 1½	1,200	47 00	4,775
Total		514									
St. Paul Ry., Escanaba, Mich.	1	240	3 @ 50 1 @ 25	91,400 42,000	40 2¾	66 6	52 0	120 @ 27 120 @ 29	1,500	45 0	2,900
St. Paul Ry., Escanaba, Mich.	2	240	4 @ 50	48,000	43 11½	69 2	54 0	30 4½	1.500	45 0	3,150
Total		480		90,000							
Algoma Central Ry., Michipicoten, Ont.	1	12		.....	34 0	43 4	25 0	22 6	311 9	44 0	.....
Canadian Northern Ry., Key Harbor, Ont.	1	20	2 @ 50	2,000	41 5	61 9	28 0	30 0	240	37 30	2,315

Note:—Storage capacity revised to show working capacity for all docks on same basis.

GREAT VOLUME

Of Business of Steel Corporation Shown by Unfilled Tonnage.

The unfilled orders on the books of the Steel Corporation April 30 reached a new high point for tonnage since the plan of issuing monthly statements was inaugurated June 30, 1910, and with one exception is the largest since the panic of 1907. The tonnage on the books April 30 is announced as 5,664,885 tons, compared with 5,304,841 tons on March 31, or an increase of 360,044 tons. The one occasion reported since the third quarter of 1907, when the unfilled bookings exceeded the present mark, was at the close of the quarter ended Dec. 31, 1909, when 5,927,031 tons was on hand.

Considering the fact that the leading steel interest produced ingots in April of a tonnage only once exceeded in history and shipped on a corresponding scale, the enormous volume of new business entered in April is emphasized.

Since the plan of making monthly statements of unfilled tonnage has been followed by the Corporation, the statements of business on hand, the tonnage and percentages of increase or decline from the previous month, have been as follows:

Date.	Total.	Change, tonnage.	Change, per cent.
Apr. 30, 1912....	5,664,885	360,044+	6.97+
Mar. 31, 1912....	5,304,841	149,359—	2.79—
Feb. 29, 1912....	5,454,200	74,479+	1.38+
Jan. 31, 1912....	5,379,721	294,960+	5.71+
Dec. 31, 1911....	5,084,761	942,806+	23.24+
Nov. 30, 1911....	4,141,955	447,627+	12.06+
Oct. 31, 1911....	3,694,328	83,011+	2.25+
Sept. 30, 1911....	3,611,317	84,668—	2.34—
Aug. 31, 1911....	3,695,985	111,903+	3.33+
July 31, 1911....	3,584,085	223,027+	7.16+
June 30, 1911....	3,361,058	247,871+	7.96+
May 31, 1911....	3,113,187	105,617—	3.28—
Apr. 30, 1911....	3,218,704	228,597—	6.63—
Mar. 31, 1911....	3,447,301	46,758+	1.37+
Feb. 28, 1911....	3,400.543	289,624+	9.31+
Jan. 31, 1911....	3.110,919	436,162+	16.30+
Dec. 31, 1910....	2,674,757	85,656—	3.09—
Nov. 30, 1910....	2,760,413	111,536—	3.88—
Oct. 31, 1910....	2,871,949	286,157—	9.12—
Sept. 30, 1910....	3,158,106	379,388—	10.74—
Aug. 31, 1910....	3,537,128	433,803—	10.92—
July 31, 1910....	3,910,931	286,863—	6.72—
June 30, 1910....	4,257,794	.....	.....

Will Hold Discussions.

A committee representing the iron and steel division of the American Institute of Mining Engineers, has met and formulated plans for carrying out plans to secure papers and discussions dealing with all phases of the mining and metallurgy of the ferrous metals, to such an extent as will make the Institute one of the foremost iron and steel associations in America, useful alike to the theoretical as well as to the practical iron and steel man.

The following subjects have been suggested: Geology, Mining and Preparation of Ores; Concentrating, Nodulizing, Sintering and Briquetting; Manufactures of Coke and Other Fuels; Refractory Materials; Blast Furnace, Bessemer, Open-Hearth and Electric Furnace Practice; The Duplex Process; Treatment, Physics and Chemistry of Iron and Steel, including Metallography. A campaign has already been started to secure papers and discussions on: Alloy Steels, Heat Treatment of Steel, The Duplex Process, The Thin-Lined Blast Furnace, Fuel Gas for Open-Hearth Furnaces, Ore Concentration, Manufacture of Pig Iron, Mechanical Charging of Blast Furnaces, Gas Producers, Charcoal Iron, Electric Furnaces, Recent Improvements in Open-Hearth Furnaces and Practice. The committee will use its utmost endeavors to bring the papers presented on iron and steel to the attention of all members qualified to discuss them, and to stimulate a continuance of the discussion.

WILL ROLL SHEETS

At Plant to be Built by Apollo Steel Co., Apollo, Pa.

The Apollo Steel Co., Apollo, Pa., recently incorporated, advises that it will build a mill in that city to manufacture high-grade galvanized and black sheets. The plant will consist of one building, 157 x 500 feet, the main building to have a width of 72 feet, with a lean-to on one side 45 feet wide and one on the other side 40 feet wide. The plant will contain six hot mills, three cold mills, four annealing furnaces and two galvanized pots.

The engineering work is being done by the United Engineering & Foundry Co., of Pittsburgh. This company was also the successful bidder on the construction of the mill and its equipment. Power will be obtained from a motor, the current of which will be supplied by the West Penn Traction Co., operator of the street car line through Apollo. This current will be generated at Connellsville and transmitted by the way of Greensburg and Saltsburg, thus eliminating the necessity of a boiler plant. The company has about 8¼ acres on the river front. It expects to begin excavating during the week beginning May 13 or 20, and to have the works operating by Nov. 1.

The Youngstown Sheet & Tube Co., Youngstown O., has closed an order with the West Virginia Central Gas Co. for 12 miles of 12-inch pipe and with the South Shore Natural Gas Co. of Buffalo, N. Y., for 25 miles of 6-in pipe.

BRITISH IRON TRADE

Furnaces Resuming Slowly—Scarcity of Pig Iron.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., May 3.

The scarcity of pig iron has developed into a famine causing much concern. The blast furnaces are resuming very slowly, so that, so far, only 30 out of 84 operating before the coal strike are at work. Many of these are producing short quantities and the quality leaves a good deal to be desired. The small stocks at the works, when the coal strike stopped operations, have now practically been used up. The pressure for fresh supplies is urgent; but the blast furnaces have nothing to deliver, and a number of works must suspend operations next week until pig iron supplies are resumed. Smelters are unanimously chary of giving any undertakings as to delivery. Pig iron yards are practically cleared out, and these will have to be refilled as quickly as possible. The production of finished material is now very much below the average. In South Staffordshire, the scarcity has been so great that users have fallen back upon Cleveland iron to help them over the stile, notwithstanding the inferior quality, and the expensive railway carriage from the north of England. It will be seen that this scarcity is reflected in prices which are now 54s 2d ($13.24) for prompt delivery, 54s 4d ($13.28) one month, and 54s 10d ($13.30) three months. The amount in store at Cleveland is 390,000 tons, compared with 600,000 in August last.

Finished Iron and Steel.—The pressure for steel billets and bars and for puddled iron is almost as strong as for pig iron. British steel mills are making very little raw iron for sale, and foreign material is remarkably scarce. Any quantity of the latter could be sold, even at fairly high prices, if the stuff were forthcoming. The Belgians have been able to accept orders for 5,000 or 6,000 tons during the past week or two, but the delivery of this material is a matter of great uncertainty. British consumers are disappointed that America has not been able to assist in the supply of billets, but it is understood that high freights are keeping American material out of the market.

The Nebraska-Atchison Steel Post & Pole Co., Lincoln, Neb., has secured a building site on Burlington trackage near Sixth and N streets in that city.

Iron and Steel Securities

A heavy selling movement with early losses marked the New York stock exchange last week, trading being narrow and largely professional. There was a rally in the closing days, due to the steel trade development and the prospect of an early termination of the anthracite coal strike.

Monday, the market was weak, with prices declining. Wheat advanced to the highest price of the year. Crop reports by Ohio and Missouri indicated large deterioration during April. Tuesday, stocks opened weak, but closed firm. The government crop report was not so unfavorable as to average condition of winter wheat, but showed 6,469,000 acres abandoned, with the estimated yield 60,000,000 bushels smaller than last year. Wednesday, grain and cotton markets were reactionary. Thursday, the Bank of England rate of discount reduced from 3½ to 3 per cent; the lowest quoted in more than a year. New York stocks opened firm and higher, but a break in Illinois Central to the lowest price since the 1907 panic, caused a general reaction. Friday, market dull and irregular at the opening, but turned strong. Bethlehem Steel advanced to the highest prices of the year. Saturday, steel common led an active and strong market with several issues advancing to new high points.

Money on call ranged between 3 and 2½ per cent. Time money was quiet but sufficient to meet all needs. The actual condition of clearing house institutions showed loans increased $22,996,000; net deposits increased $31,047,000; total reserve $436,922,000, and the excess of reserve $11,920,300, a decrease of $2,356,450. Non-member banks and trust companies showed loans increased $5,218,200; net deposits increased $5,061,600; reserve on deposits increased $179,700, and the percentage of reserve 19.3, against 19.3 the week previous. Bank clearings showed a decrease of 10.5 per cent from the preceding week, and an increase of 16.7 over the corresponding week last year. Commercial failures numbered 263, compared with 315 the preceding week and 279 the corresponding week last year. Shares were sold to the number of 3,061,400, compared with 3,838,200 the preceding week and 1,840,200 the corresponding week a year ago. Bonds, exclusive of government bonds, were sold to the amount of $15,101,000, compared with $9,568,000 the preceding week and $15,153,000 the corresponding week a year ago.

	Clos'g Quo. May 11	Changes in week.	Annual Meeting date 1912	Stock Outstanding	Basis.	Dividend Last Dividend	Dividend Date Last Div. Pay
Allis-Chalmers	17⅞	+ ½		$19.820,000		.....	
Allis-Chalmers, pr.	4	—1		16,050,300	7 cum.	1¾ Q.	Feb., 1904
American Can	42¾	+3⅛	Feb. 6	41,233,300		.....	
American Can, pr.	120⅞	+3⅞		41,233,300	7 cum.	1¾ Q.	Apr., 1912
Am. Car & Fdy.	59¾	+1¼	June 27	30,000,000	2	½ Q.	Apr., 1912
Am. Car & Fdy., pr.	118	+ ½		30,000,000	7 n. c.	1¾ Q.	Apr., 1912
American Loc.	43⅝	+ ⅜	Oct. 15	25,000,000	5	1¼ Q.	Aug., 1908
American Loc., pr.	108½	— ½		25,000,000	7 cum.	1¾ Q.	Apr., 1912
American Ship	50⅞	.....	Oct. 9	7,600,000	4	2 Q.**	June, 1911
American Ship, pr.	101	—1⅜		7,900,000	7 n. c.	1¾ Q.	Apr., 1912
Am. Steel Foundries	39½	+2½	Mar. 21	17,184,000	5	1¼ Q.	May, 1911
Barney & Smith	10	.....	June 4	2,000,000	4	1 Q.	Dec., 1907
Barney & Smith, pr.	85	.....		2,500,000	8 cum.	2 Q.	Dec., 1911
Bethlehem Steel	39¾	+2⅝	April 2	14,862,000		.....	
Bethlehem Steel, pr.	73	+1½		14,908,300	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	43	.....	Mar. 19	45,000,000*	5	1¼ Q.	May, 1912
Cambria Iron	43½	— ½		8,468,000*	4	2 S. A.	Apr., 1912
Chicago Pneumatic Tool	51½	— ½	Feb. 19	6,448,800	4	1 Q.	Apr., 1912
Colorado Fuel	29½	+1½	Oct. 21	34,235,500		1¾ Q.	Apr., 1902
Crucible Steel	12	+ ½	Nov. 15	24,578,400		.....	
Crucible Steel, pr.	84	+1½		25,000,000	7 cum	1¾ Q.	Mar., 1912
Empire Steel	10	.....	Feb. 28	1,254,770		.....	
Empire Steel, pr.	45	.....		2,500,000	6 cum.	2 S. A.	July, 1911
Fay & Egan	75	.....	Feb. 20	1,000,000	7	1¾ Q.	Nov., 1908
Fay & Egan, pr.	115	.....		1,000,000	7 cum.	1¾ Q.	Feb., 1912
General Electric	170	+2	May 14	77,281,200	8	2 Q.	Apr., 1912
Harbison-Walker	39	.....	Jan. 15	18,000,000	2	½ Q.	Mar., 1912
Harbison-Walker, pr.	99	.....		9,600,000	6 cum.	1½ Q.	Apr., 1912
International Pump	30¼	+ ⅛	Dec. 10	17,762,500		½ Q.	Apr., 1905
International Pump, pr.	81¼	—1½		11,350,300	6 cum.	1½ Q.	May, 1912
Lackawanna Steel	29	.....	Mar. 13	34,978,000		.....	
Lake Sup. Corp.	29¾	+ ¾	Oct. 2	40,000,000		.....	
New York Air Brake	53½	— ½	Mar. 13	10,000,000	6	1½ Q.	July, 1911
Niles-Bement-Pond	95	.....	Feb. 7	8,500,300	6	1½ Q.	June, 1912
Niles-Bement-Pond, pr.	101	.....		2,000,000	6 cum.	1½ Q.	May, 1912
Otis-Elevator Co.	74	—1	Mar. 18	6,358,600	4	1 Q.	Apr., 1912
Otis Elevator Co., pr.	100	.....		6,375,300	6 n. c.	1½ Q.	Apr., 1912
Pa. Steel	60	.....	May 13	10,750,000		.....	
Pa. Steel, pr.	100	—1		20,587,500	7 n. c.	3½ S. A.	May, 1912
Pittsburgh Coal	21¾	+ ¾	Mar. 12	28,104,600		.....	
Pittsburgh Coal, pr.	89¾	+1¾		27,071,800	7 cum.	1¼ Q.	Apr., 1912
Pittsburgh Steel Co., pr.	102½	+ ¼	Oct. 7	7,000,000	7 cum.	1¾ Q.	June, 1912
Pressed Steel Car	35	.....	Feb. 21	12,500,000		1 Q.	Aug., 1904
Pressed Steel Car, pr.	102¼	— ¼		12,500,000	7 n. c.	1¾ Q.	May, 1912
Pullman	159¾	— ¼	Nov. 13	120,000,000	8	2 Q.	May, 1912
Railway Stl. Spring	36¾	+2¼	Mar. 7	13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring, pr.	100	.....		13,500,000	7 cum.	1¾ Q.	Mar., 1912
Rep. Iron & Steel	23¾	+ ¾	Oct. 16	27,191,300		.....	
Rep. Iron & Steel, pr.	79⅞	+1¼		25,000,000	7 cum.	1¾ Q.	Jan., 1912
Sloss-Sheffield	52½	+2½	Mar. 13	10,000,000	5	1¾ Q.	Sept., 1910
Sloss-Sheffield, pr.	100	—2		6,700,000	7 n. c.	1¾ Q.	Apr., 1912
U. S. Pipe & Fdy. Co.	18	.....	June 26	12,500,000		1 Q.	Dec., 1907
U. S. Pipe & Fdy. Co., pr.	54	—1¼		12,500,000		1¼ Q.	June, 1911
U. S. Steel	69¾	+ ¾	April 15	508,302,500	5	1¼ Q.	June, 1912
U. S. Steel, pr.	110¾	—1⅞		360,281,100	7 cum.	1¾ Q.	May, 1912
U. S. Steel 5s	102⅛	— ⅛		465,189,500	5	5 Q.‡	
Va. Iron, Coal & Coke	61½	+1½	Sept. 17	9,073,680		.....	Oct., 1907
Westinghouse Air Brake	170	+1¼	Oct. 1	14,000,000*		5. †	Apr., 1912
Westinghouse Electric	76⅛	+1⅛	June 12	3,998.700*	7 cum.	1¾ Q.	Apr., 1912

Par value of shares, $100, except those starred (*), $50.
**Includes last 1 per cent payment of 4 per cent extra.
†Stock.
‡Include 2½ regular, 1½ extra and 1 special.

Copper Stocks.

New York.—Amalgamated Copper closed 84, a net gain of 1⅜.

Boston.—Anaconda closed 41, a net loss of 1; Calumet & Arizona closed 72, a net gain of ¾; Calumet & Hecla closed 480, a net loss of 5; North Butte Mining closed 28, a net gain of ⅞; Quincy Mining closed 89½, a net gain of ½.

Financial Notes.

The American Smelting & Refining Co. has declared the usual quarterly dividends of 1¾ per cent on preferred stock, payable June 1, and of 1 per cent on common stock, payable June 15.

La Belle Iron Works stockholders will be called upon to vote this month on an increase in capital stock from $10,000,000 to $20,000,000, of which one-half will be 8 per cent cumulative preferred, and one-half common stock. Present stockholders will receive a share of preferred and a share of common for a share of the present stock.

Secret of the Wonderful Progress of Germany*

Some Facts About the Great Syndicate Which is a Powerful Business Factor in The Kaiser's Domain

By T Good

The history of the German iron and steel trade since 1897, when the syndicates controlling that industry inaugurated their famous export bounty policy, affords a striking object-lesson in commercial economies—a lesson both British and American steel-makers would do well to ponder; while current developments in Germany are not without interest for those who wish to forecast the future course of international competition.

Taking the export figures of the three leading steel countries since the Germans began this bounty method of pushing trade in foreign markets, we have this record:

Iron and Steel Exports from

	United Kingdom. Tons.	*Germany.* Tons (metric).	*United States.* Tons.
1897.....	3,318,000	768,000	561,000
1900.....	3,213,000	838,000	1,154,000
1905.....	3,721,000	3,349,000	1,009,000
1910.....	4,594,000	4,868,000	1,535,000
1911 (est)	4,500,000	5,000,000	2,150,000

Keeping in view the relative productive capacities of the countries, the fact that for the last three or four years America has had a very large portion of her capacity idle, and the further fact that British shipping facilities are far superior to those of her rivals, the German figures are wonderful. If any Americans are inclined to put German progress down to low wages, let them reflect that as an off-set against Germany's cheap labor, there is America's cheap coal. In drawing a comparison between Britain and Germany even the cheapness of labor in the latter country cannot be urged, for German wages are now at least as high as British wages, on the average, while in competition with the British, the Germans are at a disadvantage in the matter of long haulage distances from works to port. In all the circumstances, therefore, the German export figures are indeed wonderful, for they cannot be attributed to any natural advantages over the other countries.

To what, then, must we ascribe Germany's great commercial progress? The question can almost be answered in one word—organization. Organization is the mainspring of German success. Without its vast and complete system of syndication—cordial co-operation among all the manufacturers—and the fostering of exports by means of syndicate bounties, or rebates, the German iron and steel industry could not possibly have attained its present status. German progress in steel exportation is a monument to the efficiency of a special kind of organization. It is interesting, while the rumored possibility of this system coming to an end in the near future opens up the prospect of a considerable change in the international steel trade situation. Let the circumstances be carefully noted.

In order to understand how the German export bounty system works it is necessary to observe that for many years now the production, sale and price of practically every material and article of steel manufacture, from ore to machinery, have been subject to syndicate control. These syndicates are really manufacturers' trade unions and co-operative associations combined. They differ from the American "trusts" in that they do not own any works, but simply control the products of the works. Thus a company producing, or dealing in, five or six different articles will be a member of five or six separate syndicates, and not a unit of a single corporation. There are syndicates governing coal, coke, iron ore, raw steel, plates, bars, etc., etc., on to wire and even nails.

The usual method of operating is for the expert officials of a syndicate to visit periodically all the works manufacturing the particular article controlled, to ascertain capacity of production, situation of works, any special aptitude and so forth. Then orders, which are generally received by the central offices, are allotted to the various works in accordance to either capacity or geographical position. Everything possible is done to avoid waste, delay, and over-lapping. For example, a Russian or Austrian order, other things being equal, will be allotted to a Silesian works, while an English or French order will go to a Westphalian shop. If a plant happens to be at any special disadvantage it is compensated. If it is specially favored it pays extra into the pool for the benefit of others. Frequently the syndicates purchase raw materials as well as sell finished products, and attend a wide variety of matters in the interests of their constituents. But the chief point of interest for foreigners is the question of exports.

It was in 1897, as mentioned, that some of the syndicates, working in close harmony with one another, started the export bounty system. The coal, iron, steel, and other unions controlling raw or partly manufactured materials agreed to supply their associated customers—the rolling mills and others—with such materials at cheaper rates when used in the manufacture of goods for export, which had to meet foreign competition, than when the same materials were required for producing goods for the home market. Thus, large export orders could be taken below actual cost of production, because the particular plants employed upon them were subsidized by those engaged upon more profitable domestic orders, for not only did one syndicate grant rebates to another syndicate in respect of materials needed for export work, but by a system of pooling work and profits within each syndicate the plants could be compensated by their associates in case of unprofitable foreign business.

From time to time the bounty rates, or rebates, or subsidies paid in respect of foreign work, have been increased or decreased in response to the fall or rise in the home demand, the primary object being to secure full employment for the mills even when home trade has been slack. When domestic demand has been brisk the bounties have been low, or temporarily suspended, and when slow the bounties have been put up to promote export business and make good the deficiency in domestic demand. Meanwhile, capacity of production has been largely increased; but, in marked contrast to what we have seen in the United States recently, the works have secured full employment. The carefully cultivated export trade has saved the German plants from idleness. Between 1900 and 1910, for example, while American exports increased by only half a million tons, and while British exports increased by 1½ million tons,

*This article was written before the renewal of the German Syndicate or Stahlwerks Verband was accomplished. It is understood that the renewal applies to crude steel, shapes and rails.

German exports went up by 4 million tons.

So much for the past. What of the future? If the above rates of progress are maintained in the next decade, the result will be amazing. But it is hardly likely. The success of the German system has depended largely upon the existence of separate works engaged in the production of only a few articles, or perhaps only one article. Coal producers, iron producers, steel producers, rail rollers and so on have been able to co-operate in each of their own particular lines. For example the steel smelterer has been obliged to purchase his coal, coke, and iron from separate producers, and then sell his product to the rollers. Now, however, the movement is toward what are called "mixed works". As in America and Britain, the German steel makers are becoming colliery owners and iron ore miners and blast furnace men on the one hand, and rollers and engineers on the other. The result is that, under the existing system, these mixed works are in the position of having to apply to a number of syndicates for permission to transfer their goods from one part to another of their own establishments—virtually, they have to sell and buy, and sell and buy again, their own materials just as though every stage of manufacture were conducted by an independent company. Obviously, the syndicate system is getting more and more difficult to work. If it does not collapse it will have to be recast, and it is difficult to see how, even if organization continues, the bounty policy can be maintained. If the bounties go, then the whole character of German competition will be modified, for individual companies cannot conduct a great export business below actual cost of production, like the syndicates have done. The greatest of all the German syndicates terminates automatically in June next, and it is freely rumored that it will not be renewed. Certainly the difficulties in the way of renewal are formidable. If this great union collapses, many of the smaller syndicates will fall. Of course, our German rivals have an inherent capacity for organization; but the new developments seem to demand a new kind of organization, and, if the existing kind of syndicate, with its bounties has to go, a most interesting chapter in the annals of commerce will be closed, and that particular form of German competition which has been little less than a blight on international trade will cease.

Sheffield, Eng., April 15.

TEN COMMANDMENTS

To Prevent Accidents and Promote Sanitation at Inland Steel Plant.

The Inland Steel Co., Chicago, in common with other independent steel manufacturers and the United States Steel Corporation, has been making special efforts toward the promotion of safety in its plants. In this connection, large posters containing Ten Commandments to prevent accidents and to promote sanitation have been recently devised by the safety department and placed conspicuously throughout the works. The posters are printed in old English type cards 11 x 14 inches in size. A series of rules to foremen, relative to the prevention of accidents has also been printed on similar cards and posted throughout the plant. This work is under the supervision of J. C. Smith, safety inspector for the Inland Steel Co. The notices are as follows:

Ten Commandments

To Prevent Accidents and Promote Sanitation.

1. Get the safety habit. Don't take chances. Learn all the rules, understand your work thoroughly. Study the dangers incident thereto and avoid them. Think before you act.

2. Do not work with defective chains, cables, tools or appliances of any kind, or in an unsafe place. Carefully examine same and report dangerous conditions to your foreman.

3. Never work on a crane, table or other machinery, until you have notified the operator, and attached a sign, "Danger, Do Not Move," bearing your name, at the point where the power is turned on. No man except the man who placed it should ever remove such sign.

4. Do not turn on any electricity, gas, steam, air or water, or set in motion any machinery, or throw down any material, without first seeing if anyone is in a position to be injured, and all safety guards are in their proper place.

5. Do not go onto an overhead crane runway, for any purpose, without permission from your foreman, and then not until the cranemen have been notified and a sign, "Danger, Men On Crane Track," hung in cage before cranemen. After notifying cranemen attach bumping block to crane rail between where you are working and cranes. Use same precautions when working near crane tracks.

6. Wear goggles when working around circular saws, chipping, handling acid, cutting cables, working at emery wheels, etc.

7. Do not ride on, or operate, engines, cars, cranes, elevators or other moving bodies, or tamper with electrical apparatus, unless authorized to do so. Never leave your regular place of work except when required by your duties.

8. If you make an opening, or remove the cover from any opening, in floor, ground, valve pit or sewer, guard that opening so no one can fall into it.

9. Do not pile any material so high it is liable to fall, or cause another pile to fall, or allow it to lean against walls too weak to bear the pressure.

10. Commit no nuisance, be clean and help to keep the plant clean. Conduct your private life so that you are at all times in the very best physical condition, wide awake and active.

Rules to Foremen

1. Foremen should provide themselves with copies of the Book of Rules.

2. Foremen will be held responsible for accidents to their men.

3. Caution your sub-foremen regarding the prevention of accidents. You are responsible for their actions.

4. Watch for men who are hurt frequently and put them where they will not get hurt.

5. Before putting men to work on a job warn them of the dangers and how to avoid them. If you find a man disregarding your warning, deal with him so that it will not occur again.

6. Do not put slow, heavy men on a job where quick, active men are required, nor place slow-thinking men around machinery or where presence of mind is required, or you will increase your chances of accidents.

7. Never work on a crane, table or other machinery before you have notified the operator, and attached a danger sign bearing your name at the point where the power is turned on.

8. If machinery, tools, or other appliances, with which you are working are dangerous, DO NOT CONTINUE TO USE THEM, but call your superintendent.

9. When you finish a job leave the conditions safe; replace safeguards and do not leave loose material overhead.

10. When an accident occurs immediately notify the safety department, and preserve any material, tool or piece of machinery involved in the accident.

11. Drill your men to immediately notify you when injured.

12. A foremen's accident report must be filled out for every accident, on forms provided, and mailed immediately; the names of all witnesses should appear on this report.

13. Investigate every accident and try to prevent accident occurring in like manner.

14. Never have a man in your employ to whom no one can talk.

15. Injured men should not be allowed to go to the doctor unassisted, where the injury is other than of a minor nature.

16. Foremen on one turn should report to and discuss with the foreman on the other turn accidents they have had, with a view to preventing like accidents.

17. When it is necessary for men to work above or below other men those men should be notified.

18. No runway should be less than 24 inches wide and should be cleated together on the under side.

19. All appliances should be frequently and carefully inspected.

20. Before doing any work where there is danger of coming into contact with electric wires, notify the chief electrician, who will send an experienced man to advise concerning the work.

21. Care should be taken in loading material on cars, so that nothing will fall off in transit. See that weight of load is properly distributed on car and large pieces are braced.

22. In the process of new construction or repairs the surrounding premises must be kept as orderly as possible. Boards with nails sticking up must not be left lying around.

23. No person should be allowed to operate any crane or other machinery unless duly authorized by the proper authorities.

24. Make it your personal duty to see that the safeguards and signs installed to promote safety are always in good condition.

25. REMEMBER:—THE PREVENTION OF ACCIDENTS IS ONE OF YOUR MOST IMPORTANT DUTIES.

MEXICAN IRON ORE

And the Panama Canal—Prospects as to Development.

Special Correspondence.

Mexico City, May 10.—In anticipation of the cheap freight rates which are expected from opening of the Panama canal the owners of the iron ore deposits in Mexico tributary to the Pacific ports are endeavoring to induce negotiations. The most notable of these deposits is the Las Truchas, at the mouth of the river Balsas, now under investigation by American interests. In the same locality are other similar deposits, although so far as known none of equal magnitude or so accessible. A few years ago, Minnesota parties had an engineer make an investigation of all of the iron deposits along this part of the coast in Guerrero and Michoacan, and his report was in general unfavorable as to the availability for large operation of any other deposits except the Las Truchas. Other deposits were noted near Coalcoman and elsewhere in the costal region, some of them of good grade and promising for exploration, but they were mostly situated in the rugged foothills and difficult of approach. Moreover no available harbor exists in that Pacific litoral, between the mouth of the river Balsas and Manzanillo, in Tepic. Some deposits are known in Guerrero back from Acapulco, and it was thought at one time that they would be made available by the projected railroad to the La Dicha copper mine floated by the ill-fated Mitchell Mining Co. The road was never built and rather large investments made in these deposits by a Chicago syndicate about 10 years ago have not yet been realized on. Another deposit on the river Verd, near Santiago Minas, is available for shipment to a Pacific port, if the projected railroad from Oaxaca to the Pacific down the Verde valley, is ever built. St. Louis interests own this deposit and at one time a few years ago planned to inaugurate a local iron industry, using charcoal for fuel. At Tonala, South of Salina Cruz, on the Pan-American railroad, is a deposit of magnetite reported large and accessible. It has not been explored. No other deposits are known north of Manzanillo which are at present available for transport to the coast. The Durango "Iron Mountain" deposit may some day be connected with the Pacific with a railroad, but it will be a long time and the distance is more than 300 miles, over what will be an expensive railroad to build. Some deposits are found in Sonora, notably the Cedros on the Yaqui river. In Lower (Baja) California are important deposits on the Pacific side, near Ensenada. They are owned in Los Angeles, Cal., and were at one time the basis of a proposed ambitious steel project for Los Angeles, which had many of the requisites of success except money. Extensive disseminated manganese deposits are found on the southern part of the peninsula.

Reviewing the facts, it will be seen that there are really only two definite propositions which may be utilized to take advantage of this approaching Panama canal route.

None of these Mexican deposits on the Pacific slope have been at all available for the eastern United States or Europen markets heretofore. The rate around the Horn by tramp steamers was low, but the time of transit was long and the service inadequate to justify an iron mining operation. In fact, the rate, low as it was, was too high for iron ore. A proposition to ship via the Isthmus of Tehuantepec railroad was considered a few years ago, and the data submitted to transportation engineers was disapproved as involving too great an outlay for loading and unloading facilities at the Isthmus ports for the operation of a single project to justify. Since this investigation, the Pacific iron deposits have been quiescent until recently except the mentioned proposal to utilize the Lower California deposit.

The shipment of the Mexican ore to Atlantic ports via Panama would involve some arrangement for a return freight for the vessels as the distance and time factors in the trip are great.

Cement Output Shows Constant Growth

The quantity of cement produced in this country, according to statistics of the Department of Commerce and Labor, has grown from 8,000,000 barrels in 1890, to 17,000,000 in 1900 and 78,000,000 in 1910, the value having increased from $6,000,000 in 1890 to $13,000,000 in 1900 and $69,000,000 in 1910. The quantity of cement exported has grown from 76,055 barrels in 1890, valued at $163,162, to 2,971,474 barrels in 1911, valued at $4,349,290, while the figures for the nine months ending with March indicate that the total for the fiscal year 1912 will considerably exceed in both quantity and value that of 1911, and will probably amount to more than 3,000,000 barrels.

ASK INTERPRETATION

Of Sherman Act—Merchants' Request to Congress for Remedy.

In a memorial which has been sent to congress by the Merchants' Association of New York, elucidation of the present uncertainties in the Sherman anti-trust act is asked, and it is suggested that legislation be enacted along the lines of the Canadian "combines investigation act" which is intended to facilitate the speedy adjudication of the legal status of any business association. It is declared that the effect of the passage of the law shaped after the Canadian act would be two-fold; first, there would be the permission of certain acts of partial restraint and monopoly, and secondly, retroactive punishment would be eliminated. The memorial says further:

By the enactment of such a law the embargo which now lies so heavily on our industry and commerce would quickly be raised. Business of all kinds would leave port and again venture to sea, willing to take fair risks and prepared to withdraw from or to modify any co-operative plans tentatively adopted if and when they should be found to be forbidden, but with assurance of exemption from penalty or punishment for so doing up to the time of such adverse finding.

The Canadian law points the way to a solution of the problem. It provides for a speedy investigation in any case where six or more citizens unite in demanding it and for full publicity as to all the facts brought out by such investigations. In each case, a commission is created consisting of a member nominated by the parties complainant, a member nominated by the parties defendant and a third member nominated by the first two, all appointed by a court. The commission reports upon the facts, whereupon the court announces its decision. Such an act may be passed and become effective without altering or amending the Sherman act in any particular.

The proper function of the law is not to define what may be done but what may not be done. All else in this free land of ours is permissible to any citizen.

The memorial was drawn in argumentative form by Henry R. Towne, of the Yale & Towne Mfg. Co., president of the association.

Show Rooms Removed.—The Van Dyck-Churchill Co., Singer building, New York, has completed the removal of its stock of machine tools from 85 Liberty street to the new warehouse at Hudson and Morris streets, Jersey City, N. J. The present show rooms are accessible to the Hudson tubes, and can be reached in 12 minutes from the company's offices in New York.

NEW STEEL PLANT

Will be Established in the Calumet District—Schlesinger Talks.

Milwaukee, May 13.—Ferdinand Schlesinger, of Milwaukee, founder and principal owner of the Milwaukee Solvay Coke Co., admits his connection with a deal which means the establishment of a steel plant to employ 5,000 men in Hammond, Ind.

The establishment of this plant in the Calumet region—as the territory about Hammond is known—is made possible by the purhase by Mr. Schlesinger and his associates of 415 acres within the city limits of Hammond. The price paid for the site is said to be in excess of $500,000.

That the proposed plant is to turn the output of the Schlesinger mines into finished product was also admitted as the plan.

"We have secured," said Mr. Schlesinger, "some 415 acres of land within the city limits of Hammond and it is correct that we plan the establishment of plants there. We had planned to keep the negotiations quiet until perhaps the first of June, owing to the fact that many of the details necessary have not been completed.

"About all that can be added to the story already circulated is that the plants are being established simply to turn the output of our mining properties into finished materials."

The purchase of the land was negotiated by C. W. Hotchkiss, formerly general manager of the Chicago, Indiana & Southern railroad, now president of the Illinois Tunnel Co., who was instrumental in locating the Baldwin Locomotive Works' plant at Calumet, East Chicago.

The syndicate will start construction work on the plant soon after July 1, upon the completion of necessary street improvements by the municipal authorities. It is expected that two years will be needed to complete the proposed plant, the products of which will probably include pig iron, plates, bars and shapes.

In connection with the purchase of this tract by the syndicate is an obligation upon the part of the selling company to complete as soon as possible the Indiana harbor ship canal west to Wolf Lake. This work, which has been in progress for some time, necessitates the dredging of a canal to a depth of 21 feet, with a width of 200 feet at the surface and 84 feet at the bottom.

Besides canal privileges, the contemplated plant will have excellent land shipment facilities. Within a radius of 2 miles of the site of the proposed plant are many industries employing thousands.

OHIO ENGINEERS

Will Hold Meeting in Pittsburgh—Will Have Swimming Party.

The twenty-fifth meeting of the Ohio Society of Mechanical, Electrical and Steam Engineers will be held, May 16, 17 and 18, at Pittsburgh. Thursday afternoon, the members and guests will take trolley cars from the Hotel Schenley for the Pittsburgh testing station, United States bureau of mines, where there will be an inspection and demonstration. The evening meeting will be held at the rooms of the Engineers' Society of Western Pennsylvania, in the Oliver building. Hon. Charles H. Garlick, chief boiler inspector of Allegheny county, will deliver the address of welcome and several papers will be read. At 11 p. m. there will be an owl party. Members will leave the convention hall for a trip to the Phipps power plant, to inspect powdered coal-stoking equipment, the largest installation of this kind in the world. The inspection will last until midnight, when the party will adjourn to the Pittsburgh natatorium, in the same building, for a midnight swimming party. Friday will be devoted to business meetings and an inspection trip to the Carnegie technical schools. The closing session will be held Saturday morning.

Unlawful Restriction Alleged

Washington, D. C., May 14. — A committee representing some large interests controlling manganese deposits in Arkansas, Colorado and the west has recently been here with a view of having the government undertake an investigation of an alleged unlawful restriction of the manganese business of the country. The claim is that auxiliary interests of the United States Steel Corporation are in control of the Brazilian and other manganese deposits, and of the plants engaged in the manufacture of ferromanganese and that by reason of internal influence and arbitrary trade specifications these interests dominate the manganese business and in effect prevent the marketing of manganese ore produced by independent mines in the United States. No particulars of the allegations or any intimation of the result of the conference has been given out by the committee.

MACHINE TOOL BUILDERS

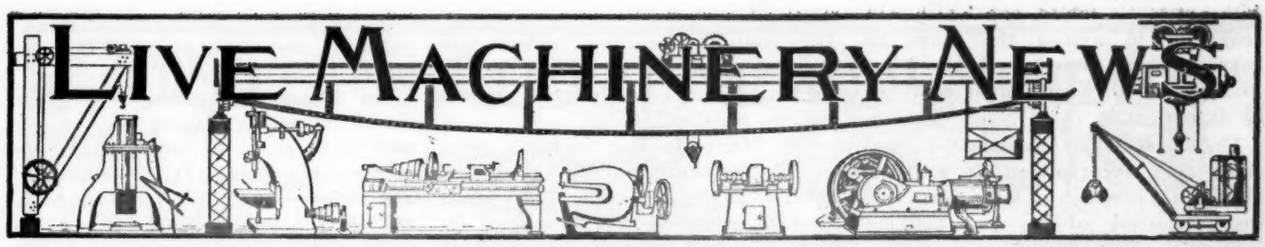
Will Hold Meeting at Atlantic City This Week.

The tenth semi-annual convention of the National Machine Tool Builders' Association will be held at the Chalfonte, Atlantic City, Thursday and Friday, May 16 and 17. At the first session, Thursday, the following committees will report: Committee on standardization, D. M. Wright, chairman; committee on matter of prices to be charged educational institutions, C. Wood Walter, chairman; report of the fight against placing machine tools on the free list before the senate committee, Fred A. Geier.

At the afternoon session the following papers will be read: "The Value of a House Organ as an Advertising Medium," by Charles E. Carpenter, general manager E. F. Houghton & Co., Philadelphia; "How Can the Mechanical Journals be Made of the Most Value to Their Patrons?" by Fred E. Rogers, editor of *Machinery;* "What the Association can do for Its Membership," by James H. Herron, permanent secretary National Machine Tool Builders' Association. In the evening there will be "a heart-to-heart talk" at the executive session. Friday morning will be devoted to committee reports. Friday afternoon, Charles E. Hildreth, general secretary, will deliver an address on "What the Future has in Store for Us."

To Enter Model Plant.—Additions to the Riter-Conley Mfg. Co. plant at Leetsdale, Pa., where all departments of the company are to be located, will consist of a new shop to be especially well equipped with machinery, part of which is now in the Allegheny shop. Modern machines, giving the plant an increased capacity of 60,000 tons a year, will be added. This shop will be devoted to construction work on the skyscraper office buildings, steel mills, mining structures, viaducts, ore docks and industrial buildings. Transmission towers will be manufactured in a special department. Shops at Allegheny and offices in Pittsburgh will be abandoned just as soon as new buildings at Leetsdale are ready for occupancy. The company has occupied offices at 55 Water street, Pittsburgh, nearly half a century.

Hamilton & Hansell, mining engineers, have removed their offices to 50 Church street, New York City.



In New York, dealers continue to do a fair volume of business, although no important new lists of machinery specifications have come out recently in that market. Builders of heavy cranes for inside and outdoor work have booked a large total of orders the last two or three months and unfilled inquiries now up for consideration aggregate the most encouraging total of prospective business which that class of manufacturers have had for more than a year. Machine tool dealers are expecting acceptancies from the Delaware & Hudson Railroad Co. this week and from the Safety Car Heating Co. the latter part of the month, for an aggregate of about $250,000 worth of business. Besides these, there is a large total of inquiries for shop equipment made up of small lots. A number of commercial building contracts, calling for considerable special and power equipment, have been let in this territory.

In the Pittsburgh market new inquiries for machinery are coming in more freely, and there is considerable important business under negotiation, but actual closing of orders has not been large the past week. Estimating is going on in connection with the new tin-plate plant at Warren, Pa., which represents one of the larger prospects. The demand for rolls is stronger, and roll makers are fairly busy. The general attitude in regard to prices has not changed as yet, and is not satisfactory.

In Cleveland, market conditions remain about the same, dealers reporting a fair volume of business. Numerous small orders have been received and a scattering number of fairly good-sized orders have come in. The market for second hand machinery is exceptionally quiet.

Power Plant Equipment

The citizens of Alameda, Cal., have voted bonds to the extent of $150,000 for extensions to the municipal electric light plant.

The Shenango Railway & Light Co., Youngstown, O., has awarded a general contract for the construction of a new power plant at Lowellville, O., to Stone & Webster Co. with a capacity of 40,000 horsepower. The new plant will have turbo-generators, and will be used to care for the increased lighting and power supply of this company.

The West Penn Steel Co., Brackenridge, Pa., is increasing the capacity of its power plant by the addition of new electrical equipment comprising one 1,875-kilovoltampere turbo-generator, one 25-kilowatt turbo-generator, one 720-kilowatt motor-generator set, three 50-kilovoltampere transformers, one 150-horsepower motor, one 750-horsepower motor and switchboard. All this apparatus is being furnished by the General Electric Co.

New Construction

The Standard Chain Co., Pittsburgh, Pa., advises it has arranged improvements and extensions to its plant at Marion, Ind.

The Hope Steel Bridge Co., Hope, Ark., contemplates the erection of a plant for the building of steel bridges. Taylor H. Allen is president of the company.

The Iowa Iron & Metal Co., Des Moines, Ia., contemplates building a foundry at San Diego, Cal. The company advises it is unable to give particulars at this time.

The Guernsey and O'Meara Co., Philadelphia, is estimating on plans for a steel and concrete pier, 637 feet in length, at League Island navy yard.

A four-story addition to the power plant of the Philadelphia Electric Co. will be constructed at Christian street and Schuylkill avenue, Philadelphia, to cover 55 x 170 feet.

The Kentucky Public Service Corporation will rebuild the gas plant at Frankfort, Ky. It will also reconstruct the gas works at Clarksville, Tenn., which it recently purchased.

The Rome Iron Works, Rome, N. Y., is erecting a concrete and steel building, 125 x 133 feet. Some of the machinery for the plant is being built in the company's plant; other machinery has been purchased.

The Miand-Cycle & Mfg. Co., Middletown, O., is having plans prepared for a four-story reinforced concrete office and factory building. George Barkman, Hamilton, O., is the architect in charge.

The Birmingham Tool & Implement Co., Birmingham, Ala., will build a plant in North Birmingham to build hay presses. B. S. Webber is president; A. J. Gray, vice president, and E. D. H. Spiva secretary-treasurer.

The Valley Mold & Iron Co., Sharpsville, Pa., has completed plans for an addition to its foundry. Floyd K. Smith, vice president, advises that the company has not yet asked for bids and has not decided definitely when the extension will be made.

The Michigan Steel Castings Co., Detroit, is planning another large addition to its foundry. The addition, 90 x 150 feet, will be of steel and brick construction. A large converter and a couple of electric traveling cranes will be installed.

The Ajax Metal Co., Philadelphia, intends building a new plant on the five acres recently purchased from John Meighan. The tract lies to the southwest of the Kensington & Tacony railroad, affording an ideal location for a manufacturing plant.

The Berger Mfg. Co., Canton, O., has awarded a general contract to the Osborn Engineering Co., Cleveland, for a large factory building adjoining the present plant. The main building will be four stories of reinforced concrete 80 x 300 feet.

The Standard Metal Mfg. Co., 237 Chestnut street, Newark, N. J., will erect a brick factory building at Jefferson and Malvern streets. Frank F. Ward, 239 Roseville avenue, prepared the plans which call for a three-story structure, 106 x 40 feet, to cost $18,000.

The American Foundry & Construction Co., Pittsburgh, has purchased a lot 160 x 190 feet, in the Hazelwood district of Pittsburgh, adjoining its present plant for the purpose of enlarging and increasing capacity. The details of the improvements have not been announced.

The Alan Wood Iron & Steel Co. is preparing plans for additions to the plant which include a plate mill

with automatic tables, and which will enable it to extend the range of gages of blue annealed sheets down to No. 12 with a maximum width of 72 inches.

The Sieverkropp Engine Co., Racine, Wis., incorporated at $100,000, intends to establish a large plant for the production of gas and gasoline engines and motors. The promoters are Harry R. Sieverkropp, Fred P. Sax and Andrew Sieverkropp, all of Racine.

About 200 tons of concrete re-inforcing bars and other necessary steel construction will be required to build the new factory of the C. A. Kreimer Co., at 813-817 Main street, Cincinnati. The Roche-Bruner Building Co., Johnston building, Cincinnati, have the general contract for the work.

The Cincinnati Gear Co., Cincinnati, will build a new plant on Reading road, near Florence avenue, in the near future. The company has acquired a lot 150 x 150 feet and plans for the buildings are being prepared. The entire cost will be about $20,000. The company is now located at Ninth avenue and Broadway, Cincinnati.

The McInnes-McCleary Foundry Co., Wellsburg, W. Va., has been chartered at Charleston, W. Va., and will build a general foundry and machine shop in Brooks county, W. Va. The company has a capital of $10,000. The incorporators include E. M. Moodey, Colin McInnes, James P. McCleary, S. George, James H. Mathews and George W. McCleary, of Wellsburg.

The Barry-Wehmiller Machinery Co., St. Louis, has obtained a tract fronting 772 feet on Rosalie street and the North End Terminal Belt line in that city, and will build a two-story building, 90 x 300 feet, of reinforced concrete and a large office of the same material. The company will occupy the new plant upon its completion, making the change to get better shipping facilities.

The Woodward Iron Co., Birmingham, Ala., which recently absorbed the Birmingham Coal & Iron Co., is having plans drawn for re-organization of plants involving some new construction work. It is said that $800,000 will be spent in putting in another battery of by-product coke ovens. Plans are also under consideration for the erection of one blast furnace and the rebuilding of another.

The Eastern Wisconsin Railway & Light Co. and Wisconsin Electric Railway Co. will expend from $10,000 to $15,000 in increasing the power capacity of the plant at Oshkosh, Wis. The scheme contemplates the addition of 300 horsepower. No new electrical equipment will be required. The contract for new boilers has been awarded to the Babcock-Wilcox Co. Jones underfeed stokers will be installed.

The Marinette Machinery & Mfg. Co. has been organized at Marinette, Wis., by Peter Arnovitz, iron dealer, to manufacture machinery and to do general repair and rebuilding work. With Mr. Arnovitz are associated William A. Wood, Marinette, and John T. Roscoe, Menominee, Mich., expert machinists, who have been associated with The Prescott Co., Menominee. A large addition will be built on ground purchased by the company adjoining the business place of Mr. Arnovitz.

Water Works

The city of Madisonville, Ky., will appoint a board of public works to have charge of the construction and operation of a waterworks system. It will cost $75,000.

The Borough of Homestead, Pa., has awarded to Chester & Fleming, hydraulic engineers, Pittsburgh, the work of planning and constructing a high-service pumping station for the waterworks of the borough.

Machine Tools

The Virginia Bridge & Iron Co., Roanoke, Va., will expend $50,000 for improvements to its branch works. Crane runways will be extended, additional punching and shearing and riveting equipment will be installed and several minor additions are planned. Much of the work will be done in the company's shops.

Miscellaneous

The plant of the Cook Mfg. Co., Albion, Mich., will be disposed of at public auction on May 14, by order of the referee in bankruptcy.

The Greenville Silica Sand & Quarry Co., Greenville, Pa., has ordered much new machinery and is remodeling its plant at Greenville.

The Brier Hill Steel Co., Youngstown, O., has paid a premium of $3,912.60 into the state insurance fund of the workmen's compensation act, the largest contribution yet received.

The Byron Jackson Iron Works has been awarded the contract for furnishing two motor driven pumping sets to the city of San Francisco, the contract price being $4,200.

Employes of the Williams Foundry & Machine Co., Akron, O., were given $1,000 recently, it having been distributed among them by directors of the company. This is the first distribution made since the directors decided to share the profits with employes.

The Skinner Shipbuilding & Drydock Co., Baltimore, is drawing plans for a steel oil barge, to be built to the order of the Gulf Refining Co., New York. The vessel is to be 153 feet long, with a 23.3-foot beam.

The Oliver Chilled Plow Co. is reported to have purchased 15,000 acres of coal and timber lands in Harlan county, Ky., from the Wisconsin Steel Co., and will begin operations in the near future. The steel company has just completed several hundred coke ovens.

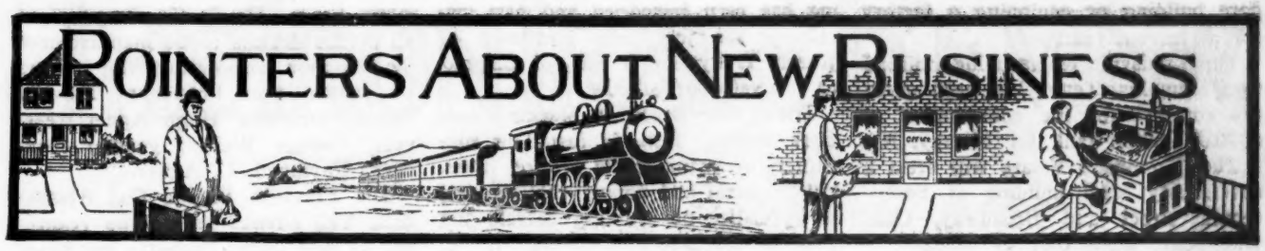
The John L. Parker Co., manufacturer of ferrules and sheet metal goods, 62 Jackson street, Worcester, Mass., filed a voluntary petition in bankruptcy in the United States district court in Boston, Monday, May 6. Liabilities are scheduled at $56,577.97, and assets at $45,800. The company was established in 1869.

A company is now being formed at New Castle, Pa., for the manufacture of automatic fire-escapes under patents taken out by the late William B. Wood. George W. Long and James Moorehead, both of New Castle, are active in developing the company with a charter under the laws of Ohio, and $25,000 capital stock.

The Penn Motor Co., Pittsburgh, which is building a new plant at New Castle, Pa., has increased its capital and is pushing its construction work rapidly. It is now asking bids on a new office building and other structures which will be built adjoining the present main structure. The company soon will be able to move the equipment from its temporary plant in Pittsburgh.

While workmen were blowing out "A" stack of the Central blast furnace of the American Steel & Wire Co., at Cleveland, May 8, an explosion occurred which killed eight men and injured seven others. The explosion was caused by water coming in contact with the incandescent fuel when the workmen were disengaging the tuyeres. The stack is being blown out for relining.

The Youngstown Sheet & Tube Co., Youngstown, O., recently closed a contract with the Mesta Machine Co., Pittsburgh, for two 84-inch type B. helander barometric condensers, with a capacity of 80,000 pounds of steam per hour, and also two Mesta rotative crank and fly wheel type dry air pumps for the condensers. The pumps are 12-inch and 30-inch x 21. The equipment is to be used in connection with construction work now under way at the company's plant.



New Buyers

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

The following manufacturing companies have filed articles of incorporation:

Traction Appliance Co., Vincennes, Ind.; $35,000; to manufacture electric and gasoline motors; by F. C. Morgan, G. E. Henry and J. J. Risch.

Rowland Firth & Son, Phillipsburg, N. J.; $125,000; to deal in iron, steel, iron ore, coke, etc.; by R. Firth, C. S. Firth, J. I. Firth, and others.

Twisted Wire & Steel Co., Manhattan, New York City; $95,000; to manufacture wire and articles of metal wire; by J. S. Klotz, A. Feldblum, P. Davidson, Brooklyn, N. Y.

The Appell Valve & Gear Co., Cleveland; $30,000; to manufacture valve gears and valves; by W. J. Hunkin, J. A. Williams, A. P. Schraner, G. E. Conkey and C. Albracht.

Standard Sheet Metal Mfg. Co., Washington, Pa.; $50,000; manufacture of iron or steel or both, etc.; by James S. Forsythe, A. C. Warne and R. H. O. McDonough, all of Washington, Pa.

James N. Long Co., Philadelphia; $10,000; to manufacture stoves, ranges, heaters, etc.; by Elizabeth M. Long and Laura Kellog, 203 North Fifty-third street, Philadelphia; Fred R. Clarke, Ambler, Pa.

The Garwood Gas Lamp & Heater Co., Canton, O.; $50,000; to manufacture gas lamps, gas logs, heaters, etc.; by C. R. Welch, A. N. McCarty, Homer E. Black, G. A. Leonard, C. B. McClintock.

The Bishop Gearing, Wrench & Mfg. Co., Findlay, O.; $15,000; to manufacture wrenches and other tools of iron and steel; by George R. Thompson, R. K. Davis, H. G. David, A. L. Askam, Thos. E. Bishop.

Edwards & Smith Co., Philadelphia; $25,000; foundry and machine shop; by W. Nelson Edwards, 2117 Locust street, and Godfrey D. Smith, 2209 St. James place, both of Philadelphia; Walter J. W. Greaves, Allentown, Pa.

Thomas Paulson & Son, Inc., Brooklyn; $30,000; general brass foundry, etc.; by Thomas Paulson, 161 Prospect Park; Mary Paulson, 161 Prospect Park; William Paulson, 434 East Fifth street, all of Brooklyn.

Lighting Specialties Enameling Works, Jersey City; $300,000; to manufacture of steel, iron, etc., articles which can be subjected to a process of enameling; by L. W. Young, T. S. Bear, F. M. Egan, New York City.

Laudon Works, Ltd., Fort Erie, Ont.; capital, $20,000; to manufacture metal lighters and specialties; provisional directors, Charles P. Laudon, Jesse J. Foster, Hugh A. Rose and others.

The Victor Electric Co., Ltd., Guelph, Ont.; capital, $20,000; to manufacture electric appliances; provisional directors, Kelly Evans, Archibald H. Macdonald, Albert Wicks and others.

Keystone National Electric Co., Hoboken, N. J.; $600,000; to manufacture electrical apparatus, lamps, machinery, etc.; by D. F. Plahn, 1 Newark street, Hoboken; Chas. W. Shaffer, 203 West Ninety-first street; Robert K. Mickey, 136 Liberty street, New York.

King Fire Signal Co., Milbrook; $500,000; to manufacture fire alarm devices, etc.; by Walter J. Hildebrandt, 1245 Putnam avenue, Brooklyn; Jess K. Aldrich, 27 East Twenty-second street, G. E. Johnson, 160 Wardsworth avenue, New York City.

Kadix Newark Motor Truck Co., East Orange, N. J.; $200,000; to manufacture motor trucks; by D. Lester Dann, 41 Marcy avenue; Gustave F. Kallberg, 6 Watson street, East Orange; Russell M. Colburn, 143 Ocean avenue, Newark.

The El Arco Radiator Co., Manhattan, New York City; $10,000; to manufacture automobiles, engines, motors, etc.; by C. Philip Coleman, Vernon Munroe, both of Engelwood, N. J.; Raleigh C. Geldersleeve, 27 West Thirtieth street, New York City.

McInnes - McCleary Foundry Co., Wellsburg, W. Va.; $10,000; iron foundry and machine shops; by E. M. Woody, Pittsburgh; Colin McInnes, James P. McCleary, S. George, James H. Matthews and George W. McCleary, all of Wellsburg, W. Va.

George R. Kress & Co., Pittsburgh; $5,000; to manufacture wire cables, lightning rods, wire netting machinery for making and plating wire cables, etc.; by George R. Kress, Pittsburgh; D. A. Steuernagle, Verona Borough, Pa.; George R. Kress Jr., Pittsburgh.

American Radiator Co. of Canada, Ltd., Brantford; capital, $500,000; provisional directors, Clarence Mott Woolley, John B. Pierce, Chas. M. Parker, Wm. H. Hill, Chas. K. Foster and Frank Whitelaw, all of Chicago, and Charles H. Hodges, of Detroit.

General Industrial

The Heer Engine Co., Portsmouth, O., has increased its capital stock from $125,000 to $250,000.

The W. Harry Brown Coke Co. has awarded contracts for 200 coke ovens at the Alicia works at Connellsville, Pa.

The Durant Pattern Co., Cleveland, has leased the pattern department of the Bowler Foundry Co., that city, and established its plant there.

The Crary Machine Works, Benton Harbor, Mich., has completed a new factory building. It is not increasing its machinery equipment at present.

The Mauston Aluminum Co., Mauston, Wis., has installed a toggle drawing press weighing 9 tons, purchased from the Toledo Machine & Tool Co., Toledo, O.

The Erie City Iron Works, Erie, Pa., is in the market for prices and specifications for an angle bending roll to handle 4-inch and smaller angles.

William C. Brunt, 625 West Fifty-seventh street, New York, advises that he has built a new ornamental and structural iron shop, 35 x 80 feet. The necessary machinery has been purchased.

The lighting of the Kopper ovens of the Tennessee Coal, Iron & Railroad Co., at Corey, Ala., has put out of commission the 1,500 old style ovens at Pratt City, Ala. Something like 2,000 of the old ovens have been shut down.

The Wood & Spencer Engineering Co., Cleveland, recently incorporated, manufacturer and seller of electric lighting plants for country homes and farms, advises that it does not antici-

pate building or equipping a factory for at least a year.

The Louisville & Nashville railroad Co., Memphis, Tenn., has been given the contract for the construction of a 70,000-gallon tank for Murray, Ky.

The Thompson Estate will erect a seven-story steel building at Seventeenth street and Broadway, Oakland, Cal., at a cost of $250,000.

The Enid Metal Mfg. Co, Enid, Okla., which recently purchased a plant and equipment, will manufacture steel tanks and silos. W. W. Coates is president; E. E. Newman, vice president, and G. E. Holdridge secretary, treasurer and manager.

The Louisville & Nashville railroad will rebuild most of the bridges on its Cumberland valley division, using larger and heavier structures in order to take care of the increased coal tonnage from southeastern Kentucky.

The Paul Automatic Machine Co., 88 Broad street, Boston, recently incorporated, advises that it will deal in automatic machinery, included among which is a fare box for use in pay-enter street cars, with coin change features. The factory location has not yet been determined.

An injunction restraining the city of Milwaukee from proceeding with the work of establishing a municipal electric lighting plant has been granted. The court restrains procedure until the Wisconsin railway commission grants the municipality a permit to operate a public utility.

The Chisholm & Moore Mfg. Co., Cleveland, manufacturer of malleable iron castings and cranes, expects to occupy a new addition to its plant by June 1. New buildings, which include a machine shop and molding building, will increase capacity from between 50 to 60 per cent.

The Des Moines Silo & Mfg. Co., Des Moines, Ia., advises that it has not made plans to erect a foundry, as was reported, but that it has built an addition to its factory and will probably make several other additions before the season ends. At the present time the company is not in the market for any additional machinery.

The Sterling Vacuum Cleaner Co., Worcester, Mass., has been incorporated with a capital stock of $15,000. F. H. Fisher, Hartford, Conn., is president and treasurer, and with Olof G. Hedlund and Eric G. Thoreen constitutes the directorate. The company will equip a plant in the Baker building, 86 Foster street, Worcester.

The Denver Boiler & Iron Works Co., Denver, which recently purchased the old tramway power house at West Colfax and Third streets, that city, is making extensive improvements. The building has been remodeled and new machinery has just been purchased of Joseph T. Ryerson & Son, of Chicago, to the value of $17,500.

The Utica Brass & Machine Co., Fort Worth, Tex., is installing machinery to manufacture bronze, brass, muntz metal and copper castings and to specialize on working barrels and general machinery repairing. R. L. Carr is president; J. M. Bird, general manager and vice president, and F. L. Lightfoot, secretary.

The Warner Instrument Co., Beloit, Wis., is making additions and extensions which will enable it to increase its output from 25,000 autometers to 100,000 annually. The company recently closed a contract with the Cadillac Motor Car Co. to furnish 15,000 meters for 1913 and has closed with the Willys-Overland Co., Toledo, to supply 30,000 to 40,000 meters.

The Tomahawk Steel & Iron Works Co., Tomahawk, Wis., has purchased a long list of machinery, tools and other equipment. Plans are finished for the new building to be erected at once. It will be 100 x 120 feet, adjoining the blacksmithing works. J. F. Callan, Muskegon, Mich., the new secretary and sales manager of the company, has assumed his duties.

The Ford Motor Co., Detroit, has selected Milwaukee as one of three cities in which it will establish branch plants for the assembling of Ford cars. The company has leased the Courteen dock property on the south side, at Milwaukee, and will expend several thousand dollars in additions and new buildings. The Hickman-Lauson-Diener Co., 143 Eighth street, Milwaukee, is the company's representative for Wisconsin.

A certificate of organization has been filed changing the name of the Portland Iron & Steel Co., Portland, Me., to the Bancroft & Martin Rolling Mills Co. The capital stock was recently increased and the plant is at present shut-down, undergoing repairs. It is said that additions will also be built and more machinery installed. The officers of the new company are: President, Seth L. Martin; Clerk, Stephen C. Perry; treasurer, Joseph B. Bancroft. The officers also constitute the directorate.

The Raymond C. Agner Co., Burlington, Wis., recently incorporated with $30,000 capital stock, has leased the former high school building, which has been remodeled into a factory, and is manufacturing a line of automobile accessories, including grease guns, wrenches, tools, etc. Mr. Agner has been in the manufacturing business on a small scale for many years. He is the inventor of all of the devices to be manufactured by the new corporation, the officers of which are: President, Edward Brook; secretary, Hugh Agner; treasurer, George Weiler; general manager, Raymond C. Agner.

The Emerson Engine Co., Alexandria, Va., advises as follows regarding its new plant: Property purchased covers city square and faces five docks on the Potomac river. Among other buildings will be a machine shop, 131 x 115 feet, of steel and fireproof construction. The company will manufacture 100-horsepower steam turbines and will install automatic machines for producing small parts (such as pistons, etc.), boring mills up to 60 inches, machines capable of grinding crankshafts up to 16 inches with throws of 8 feet between centers, and traveling crane with 45-foot span.

Trade Notes

The Globe Iron Works, Duluth, Minn., has moved into its new plant, at 435 Lake avenue south. The shop is of brick on concrete foundations, 50 x 88 feet. Considerable new machinery has been installed.

The Philadelphia office of Hill, Clark & Co., Inc., manufacturer of machinery, has moved from 512 Arch street to 1001 Chestnut street. Arthur S. Day is manager of the company.

Eaton, Rhodes & Co., First National Bank building, Cincinnati, dealers in pig iron, coke, etc., have added a department, in charge of R. O. Heyser, formerly of the Norfolk & Chesapeake Coal Co., and will make a specialty of coking coals from the east Kentucky coal fields.

General offices of the Western Conduit Co., a subsidiary of the Youngstown Sheet & Tube Co., have been moved from Chicago to Youngstown, O. The plant is located at Harvey, Ill., and it is expected that eventually it will be located in Youngstown. L. J. Campbell is president of the company.

Fires

The foundry of the Plumbers' Woodwork Co., Algoma, Wis., was damaged $2,000 by fire. The foundry, formerly operated by the Newman Brass Works, will be rebuilt at once.

The car shops of the Illinois Terminal Railroad Co. at Alton, Ill., were destroyed by fire on May 3, causing a loss estimated at $50,000. The building was 200 x 300 feet. The shops were recently equipped with new machinery.